

## Choosing a Datalink System for Your Aircraft



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## Executive Summary

The availability of an accurate weather picture in flight has always been critical to the safety and utility of general aviation aircraft. With recent advances in datalink technology, a wide variety of weather products are now becoming available providing a cost-effective and practical weather picture to the general aviation pilot.

Receiving weather via satellite is the preferred method of delivery. Satellites provide full continental US coverage without geographic gaps and without the altitude restrictions associated with ground-based systems. Broadcast systems provide the fastest update rates, while Narrowcasting of datalink weather provides the most cost-effective means of delivering weather to the cockpit, and it offers two-way communication for such future applications as aircraft position reporting, maintenance data downlink, flight plan uplink, and database updating. These products take advantage of the two-way communication path possible with Avidyne's MultiLink capability.

In addition to actual hardware costs, installation is a big cost driver. Integrated datalink systems require fewer actual boxes to install, which translates to lower installation cost. When considering antenna placement, having the option of installing an antenna coupler can save thousands of dollars on installation costs. Utilizing the new combination antennas for datalink, VHF COMM, and GPS means not having to install an additional antenna, which reduces the number of holes in the pressure vessel, and reduces drag.

When it comes to datalink service, it is important to have the option of choosing a flat-rate annual subscription or a low-cost pay-as-you-go plan so you are only paying for the data you need. If you fly more than 150 hours per year, a monthly subscription may be the best plan for you. If you operate your aircraft less than 150 hours per year, a pay-as-you-go plan typically provides a more economical service solution. If you fly both inside and out of the continental United States (CONUS), Avidyne's MultiLink capability provides the best of both technologies.

Considering the utility, safety and economic implications of real time weather in the cockpit, you should expect datalink as standard equipment in your avionics. With FlightMax, the complete weather picture is displayed as an overlay on the map, with your flight plan, traffic, terrain, obstacles, and TFRs making it possible to avoid the weather with complete situational awareness anywhere in the continental United States. Avidyne's MultiLink datalink weather system provides the weather you want and is it the best-value datalink solution available.

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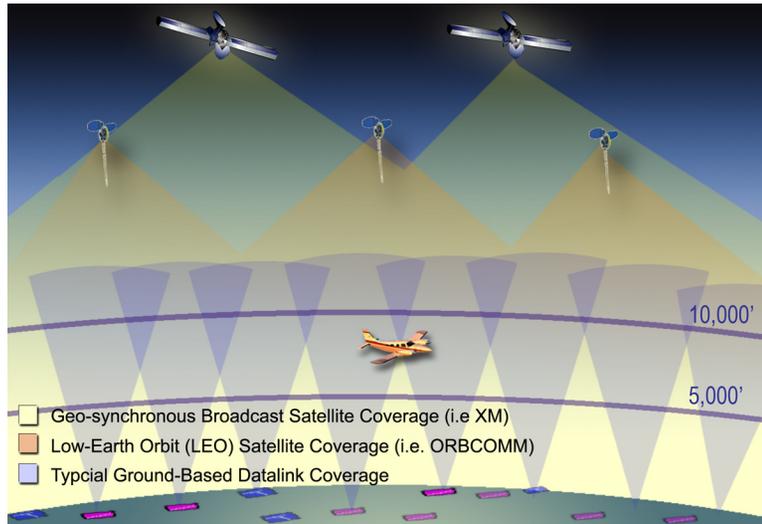
When it comes to datalink service, it is important to have the option of choosing a flat-rate annual subscription or a low-cost pay-as-you-go plan so you are only paying for the data you need. If you fly more than 150 hours per year, a monthly subscription may be the best plan for you. If you operate your aircraft less than 150 hours per year, a pay-as-you-go plan typically provides a more economical service solution. If you fly both inside and out of the continental United States (CONUS), Avidyne's MultiLink capability provides the best of both technologies.

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## Choosing a Datalink System

This document is intended to help you understand the technical differences between these systems and how those differences affect your ability to get in-flight weather. In selecting a datalink system for your airplane you should consider the following:

- Terrestrial vs. Satellite
- Broadcast vs Narrowcast vs Request/Reply
- The MultiLink Advantage
- Data and Display resolution
- Acquisition Cost
- Recurring Cost
- Growth capability



## Weather from a higher source

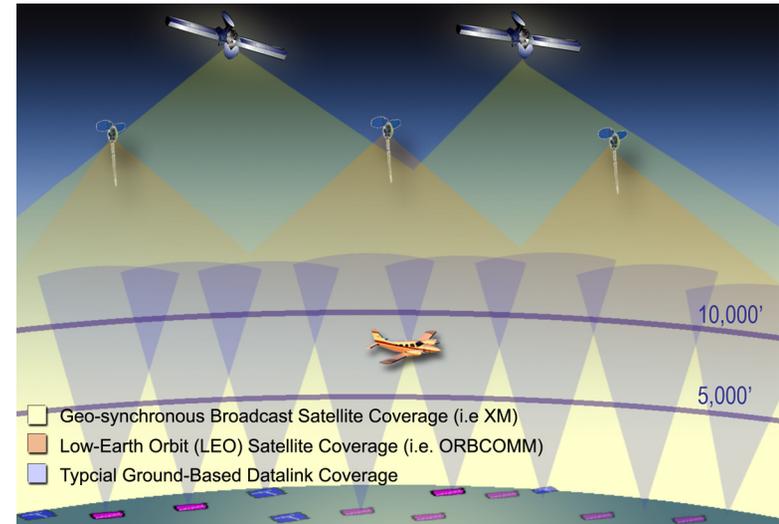
When considering which datalink delivery technology is best for you, the many advantages of satellite-based systems become pretty clear. First, the weather is always available – and most satellite systems have complete coverage throughout the continental United States (CONUS) today. The satellites have been launched and are operational today - there are no more ground stations to install. No waiting for complete US coverage.

The second and probably most important benefit of choosing a satellite-based system is that the weather is available on the ground and at relatively low altitudes. Planning your route of flight (whether VFR or IFR) is easier when you know the current weather picture. That picture is available on the ground and at any altitude via the satellite link. Terrestrial-based datalink weather systems

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require line of sight between your aircraft and the ground station, which is extremely unlikely on the ground at an airport without a ground station. Most terrestrial systems have relatively poor coverage below 5,000 feet. Terrestrial systems begin to measure their coverage and datalink availability at 5,000 feet and above. In addition, coverage over mountainous areas can be problematic. (You may remember the many-year delays in closing the mid-continent gap in the Loran system.) WSI and XM WX offer broadcast datalink weather services, while ORBCOMM provides two-way datalink services.

The XM Satellite Weather ([www.xmradio.com/weather](http://www.xmradio.com/weather)) utilizes two high-powered, geo-synchronous satellites (named "Rock" and "Roll") which provide complete coverage of the continental United States (CONUS) and coastal waters at all altitudes in any weather. Transmissions from the satellites to the aircraft use the S-Band frequencies in the 2.3 GHz range. In addition to NEXRAD, AIRMET/SIGMETs, METARs, and TFRs, XM Satellite Weather also provides access to lightning data from the National Lightning Detection Network.

The ORBCOMM ([www.orbcomm.com](http://www.orbcomm.com)) satellite network consists of 30 satellites in a Low Earth Orbit (LEO) constellation. Transmissions from the satellite to the aircraft use the VHF frequencies from 137Mhz to 138Mhz and transmissions from the aircraft to the satellites use 149Mhz to 151Mhz. There are no line of sight restrictions. In addition, the ORBCOMM constellation has the capability to deliver data outside of the CONUS, and its two-way capability allows data to be sent from the aircraft to the ground.

Both of these satellite systems provide full CONUS coverage without geographic gaps in coverage and without the altitude restrictions associated with ground-based systems.

## All datalink systems are not created equal

Once you've chosen a terrestrial or satellite based system there are four methods for transferring weather data over that network to an aircraft.

- 1) Request/Reply - Transmits data only when requested.
- 2) Narrowcast - Avidyne's unique technology for automatically providing weather products direct to the airplane.
- 3) Broadcast - Continually transmits all available weather products .
- 4) MultiLink - Avidyne's exclusive satellite datalink technology which combines the benefits of Broadcast and Narrowcast for the most advanced datalink solution available.

Lets quickly review each:

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Lets quickly review each:

## Request/Reply

In request/reply systems, weather data is only sent to the cockpit at some time after the pilot makes the initial request. Before a request is made, the pilot must make the decision that weather data is required, then compose a request for the specific weather information and the area of coverage. This request must then be sent from the aircraft to the satellite, from the satellite to the ground, processed by the ground system and transmitted back to the airplane – a trip that can exceed 10 or 15 minutes. When the request arrives at the network operations center, the weather available at that time is transmitted to the aircraft, even though this weather may be several minutes old itself. This highlights the inherent latency limitations of a request/reply system.

## Narrowcast

With Avidyne's innovative "Narrowcast" technology, weather is automatically sent to you via satellite without requiring any pilot action, and you only pay for weather when you are flying and when the datalink is enable. When you establish a datalink account with Avidyne, we assign a unique address that identifies your aircraft on the communications network. Your preferences for the weather you want, such as NEXRAD, METARs, AIRMETs/SIGMETs, TFRs and desired update rate, resolution, coverage area, and options are set through the MyAvidyne.com web portal. Upon aircraft startup, the datalink system automatically establishes a communication channel with the Avidyne Network Operation Center (NOC).

At this point, the weather is transmitted to the airplane via the satellite network, typically even before you have entered your flight plan, based on your preferences and your aircraft becomes an active node on the network. Once your route of flight is entered, we automatically send you the weather updates along your route of flight as soon as they are available – no further pilot actions are required. When you land, the Avidyne datalink system sends a simple command telling the NOC that the flight is complete and weather updates are no longer required. It's all automatic.

Avidyne's "Narrowcast" datalink is the easiest and most cost-effective way to get datalink weather in the cockpit, and it is ideal for pilots who only fly a few hours per month or a few months per year and don't want the cost of monthly or annual subscriptions.

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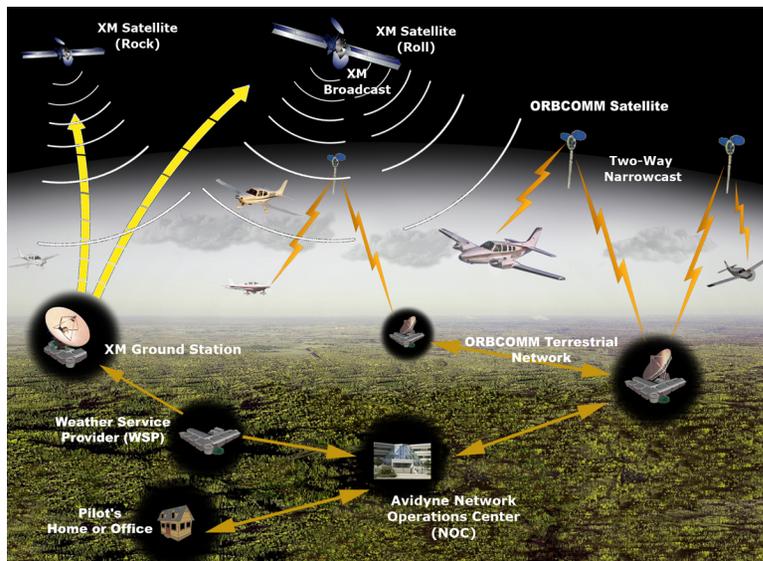
## Broadcast

Broadcast systems continuously send out the available weather products to every user in the area through a satellite network and a system of interconnected ground stations that are uniquely designed for this application. Satellite broadcast systems use high-powered geo-synchronous satellites to deliver large amounts of data in a very short amount of time, making them highly advantageous for real-time updates of aviation weather. The broadcasted signals are available to subscribers all the time and require a monthly or annual subscription fee to enable data reception. Broadcast systems typically cost around \$49 per month (\$600/year) and are ideal for pilots who fly more than 100-120 hours per year and for fleet operators who prefer fixed-fee services for budgeting purposes.

## MultiLink

Avidyne's new MultiLink™ capability allows the operation of Avidyne's Narrowcast and XM's Broadcast weather individually or together as complementary systems. Avidyne is the only company to offer certified multiple, complementary satellite datalink capabilities.

Avidyne's MultiLink customers have the ability to receive the faster update rates of graphical weather products over the XM broadcast system and the lower-cost, two-way communication capability of the narrowcast system which allows for such features as air-to-ground messaging and position reporting.



FlightMax customers can choose XM Broadcast datalink, Narrowcast Two-Way datalink, or Avidyne's exclusive MultiLink™ capability which combines the benefits of Broadcast and Narrowcast.

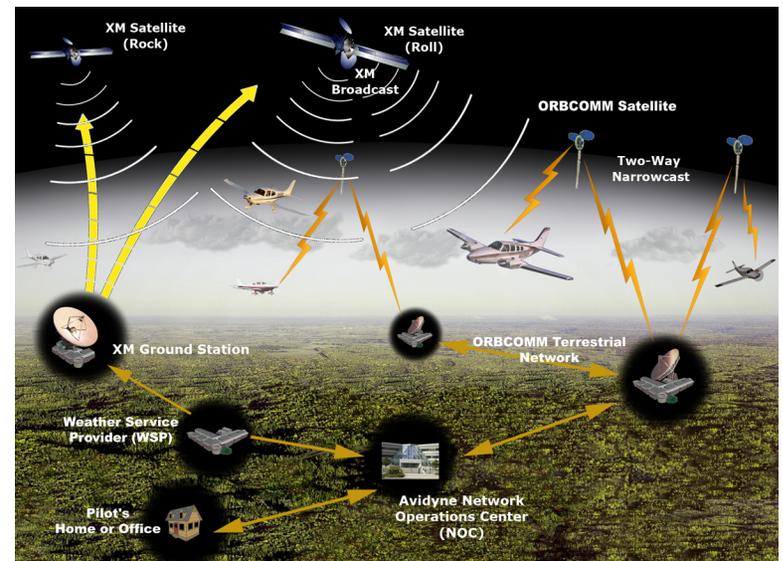
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To simplify this further, the table below illustrates most of the choices available today and displays them in the context of the previous discussion:

	Satellite	Terrestrial
<b>Request/Reply</b>	Echoflight – Available: Now on Garmin GNS500-series with GDL49	Aircell Available: Now w/ limited coverage
<b>Narrowcast</b>	Avidyne – Available: Now on Avidyne’s FlightMax EX500 and <i>Entegra</i> /EX5000 MFDs	N/A
<b>Broadcast</b>	WSI – Available: Now on MX20  XM Radio – Available: Now on Avidyne’s FlightMax EX500 and <i>Entegra</i> /EX5000 MFDs – Availability TBD for Garmin GNS500-series and G1000	Bendix/King KDR510 FIS Available: Now w/ limited coverage
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Once you've evaluated the advantages of MultiLink, Narrowcast, Broadcast, and Request/Reply systems, the next factor to consider is the weather products themselves.

### NEXRAD Weather “The way it is supposed to look”

In the United States, there are approximately 150 ground based Doppler radars each producing a local circular view at a 0.5-degree inclination to the horizon.

**NEXRAD Levels**

- light rain
- moderate rain
- heavy rain
- severe rain
- snow
- mixed

These radars paint a picture based upon the strength of the radar return, which is a function of the amount of moisture in the air (the greater the precipitation, the stronger the radar return). NEXRAD (next generation radar) is the term applied to the mosaic created from integrating these individual Doppler pictures into a single nationwide

color-coded weather picture. This national mosaic is created about once every 5 minutes and serves as the foundation for our NEXRAD weather product. The base reflectivity map, created with a resolution of 1 kilometer, is displayed in a 6-color format depending upon the intensity of the weather.



This screen shot shows NEXRAD, Lightning and TFR data from the XM broadcast system.

Avidyne's unique (patent pending) rendering process displays this high resolution data in a smoothed format consistent with more familiar weather displays such as The Weather Channel. Other systems render this high-resolution weather data into large “blocks” which are particularly noticeable at the lower map scales most commonly used during flight. In contrast, Avidyne's Data Link Weather System delivers this high-resolution data in an easy to interpret “smoothed” format. Simply put, when you zoom in, you see the weather.... not the pixels.

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## METARs - “Mini Weather Reports”

METARs (An acronym for the French translation for Aviation Routine Weather Report) are also a standard feature of many datalink weather systems. Typically updated every hour, Avidyne’s datalink weather service displays graphical METARs on the map as flags near the waypoints and/or stations that are reporting. Graphical METARs are also displayed on the trip page associated with the waypoints along your route of flight and on the Nearest Airport page, so you can see at a glance the weather conditions at your destination and for potential alternate airports. METARs come in 5 levels of severity and are color coded to indicate:

**Visibility Ceiling**

- ◀ 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

Each METAR contains a mini-weather report for that reporting point. Avidyne decodes and displays ceiling, visibility, wind speed/direction, temperature/dew point, barometric setting, and comments in plain English on the TRIP page.

GS 150 kts		TRK 282°		Time 10:01:42		UTC 14:01:42	
WPT		BRG	DTK	Dist (NM)	ETE (hh:mm)	ETA (Local)	Nrst METAR
To:	AMG	358°	359°	32.3	0:12	8:05am	<span style="color: magenta;">◀</span> KAMG
	AHN	349°	182.4	1:08	9:01am	<span style="color: yellow;">◀</span> KAHN	
	VXV	352°	303.0	1:53	9:47am	<span style="color: green;">◀</span> KTYS	
	LOZ	356°	371.4	2:19	10:12am	<span style="color: red;">◀</span> KLOZ	
	FLM	359°	468.7	2:55	10:49am	<span style="color: yellow;">◀</span> KLUK	
Dest:	KFWA	349°	614.2	3:50	11:43am	<span style="color: green;">◀</span> KFWA	

METAR Conditions at **KFWA** FT WAYNE INTL  
 Wind: 290° at 4 kts Cloud cover: 2500ft broken  
 Gust: none  
 Visibility: 1.5SM Temp/Dew: 25°C / 18°C  
 Weather: none Altimeter: 30.15 inches

Map Trip Nrst Setup Range

This screen shot shows the EX500 Trip Page with graphical METARs for each waypoint along the flight. The destination waypoint is highlighted to display the plain-English METAR on the bottom portion of the screen.

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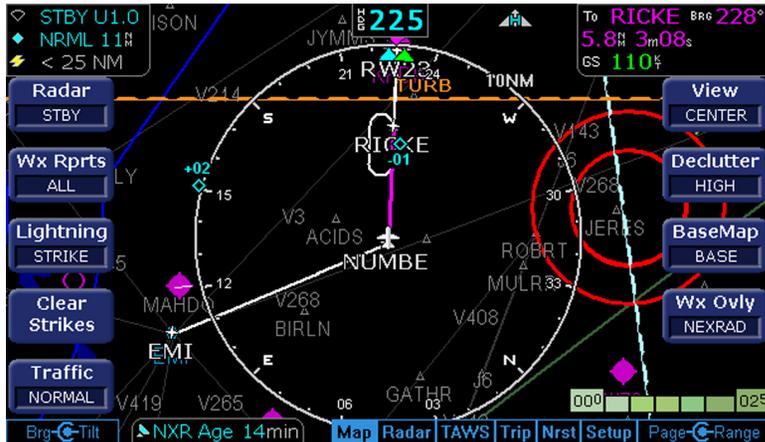
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## More than Weather – Avidyne adds TFRs

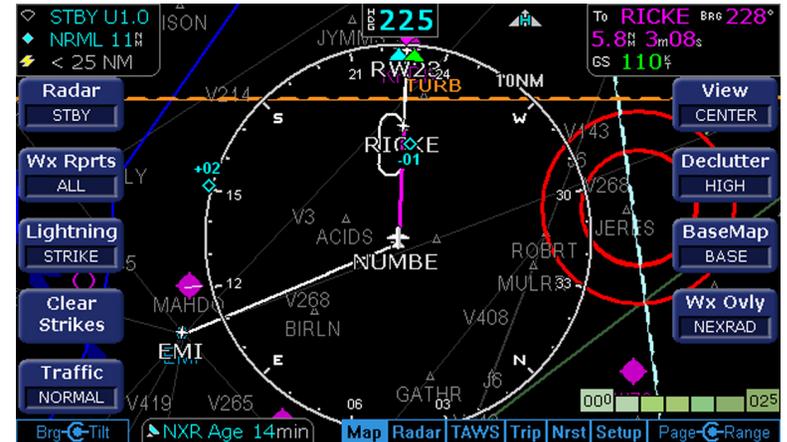
Temporary Flight Restrictions (TFRs) are updated by the FAA on a regular basis to reflect any current military or national security conditions that may be in effect. Avidyne provides the most current state of the TFRs via the satellite network and displays them on your map.



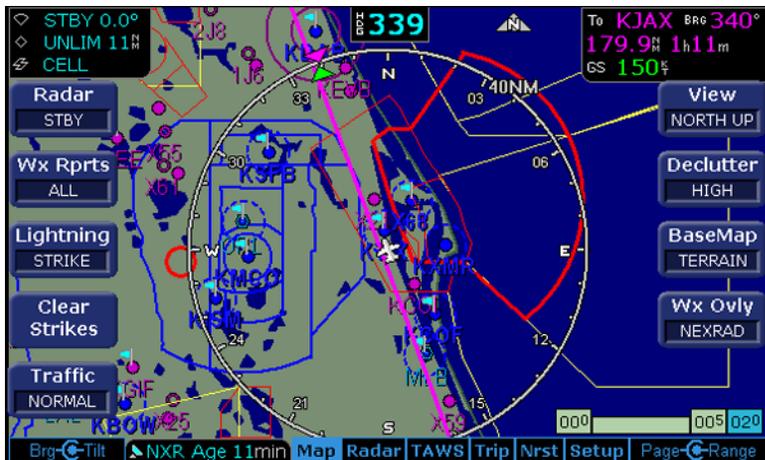
This screen shot shows the TFR over Camp David near Frederick, Md.

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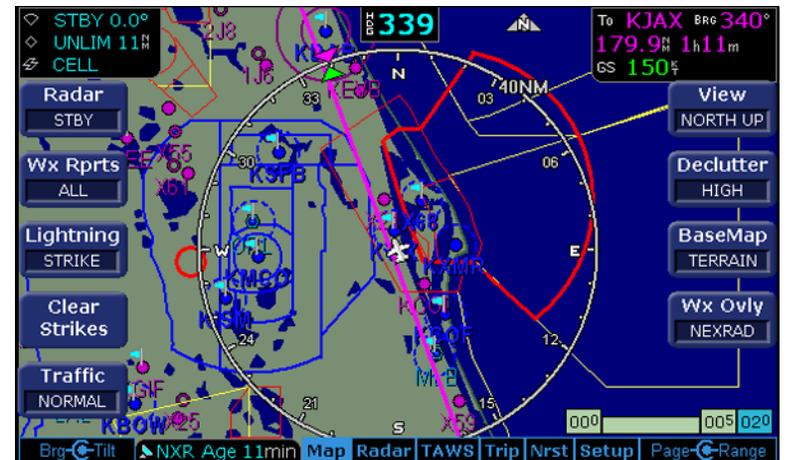
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This screen shot shows the TFR over Camp David near Frederick, Md.



This screen shot shows the TFRs over Disneyworld and the Kennedy Space Center in Florida. Having a graphical depiction of TFRs right on your moving map makes it much easier to avoid inadvertent flight into restricted areas..



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## FlightMax EX500 vs. Bendix/King KMD850

**Radar-Equipped Aircraft** - Owners of radar-equipped aircraft will continue to get the tactical benefits of on-board weather radar, and datalink will provide the strategic element of weather avoidance. The FlightMax EX500 supports 19 different radars, so in most cases you won't even need to replace your existing radar R/T, making the FlightMax EX500 the easy choice. The Bendix/King KMD850 *only* works with their digital series (RDS8X/RDR 2X00) radars. The FlightMax EX500 is the winner on price and functionality. *The EX500 with integrated datalink costs nearly \$8,000 or about 40% less than the KMD850, and the EX500 with MultiLink is still \$4,200 less than the KMD850.*

FlightMax EX500 w/ RDR 2000 Radar Interface		B/K KMD850 w/RDR 2000 Radar Interface	
			
List Price	\$11,995	List Price	\$12,408
Narrowcast Datalink	Included	KDR510 Datalink	\$5,546
TAS/TCAD interface	Included	TAS Traffic Card	\$2,000
<b>Total System Price</b>	<b>\$11,995</b>	<b>Total System Price</b>	<b>\$19,954</b>
XMD-076 Receiver for MultiLink Capability	\$3,750	XM and MultiLink Not Available	---
<b>Total System Price</b>	<b>\$15,745</b>	<b>Total System Price</b>	<b>\$19,954</b>

### FlightMax EX500 advantages over KMD 850:

- EX500 has MultiLink Capability (Narrowcast & XM)
- EX500 can overlay radar AND datalink on map
- EX500 datalink has full CONUS coverage and no altitude restrictions
- EX500 has high display brightness and high resolution
- EX500 zoom rate much more responsive
- EX500 allows for JeppView™ (CMax™) Approach Charts. (KMD850 will not show Approach Charts.)
- EX500 costs less, does more

## FlightMax EX500 vs. Bendix/King KMD850

**Radar-Equipped Aircraft** - Owners of radar-equipped aircraft will continue to get the tactical benefits of on-board weather radar, and datalink will provide the strategic element of weather avoidance. The FlightMax EX500 supports 19 different radars, so in most cases you won't even need to replace your existing radar R/T, making the FlightMax EX500 the easy choice. The Bendix/King KMD850 *only* works with their digital series (RDS8X/RDR 2X00) radars. The FlightMax EX500 is the winner on price and functionality. *The EX500 with integrated datalink costs nearly \$8,000 or about 40% less than the KMD850, and the EX500 with MultiLink is still \$4,200 less than the KMD850.*

FlightMax EX500 w/ RDR 2000 Radar Interface		B/K KMD850 w/RDR 2000 Radar Interface	
			
List Price	\$11,995	List Price	\$12,408
Narrowcast Datalink	Included	KDR510 Datalink	\$5,546
TAS/TCAD interface	Included	TAS Traffic Card	\$2,000
<b>Total System Price</b>	<b>\$11,995</b>	<b>Total System Price</b>	<b>\$19,954</b>
XMD-076 Receiver for MultiLink Capability	\$3,750	XM and MultiLink Not Available	---
<b>Total System Price</b>	<b>\$15,745</b>	<b>Total System Price</b>	<b>\$19,954</b>

### FlightMax EX500 advantages over KMD 850:

- EX500 has MultiLink Capability (Narrowcast & XM)
- EX500 can overlay radar AND datalink on map
- EX500 datalink has full CONUS coverage and no altitude restrictions
- EX500 has high display brightness and high resolution
- EX500 zoom rate much more responsive
- EX500 allows for JeppView™ (CMax™) Approach Charts. (KMD850 will not show Approach Charts.)
- EX500 costs less, does more

## FlightMax EX500 vs. Bendix/King KMD550

**Non-Radar Aircraft** - Non-radar aircraft will gain huge benefits from having datalink graphical weather on board. It costs about the same as adding a Stormscope, but adds a tremendous amount of additional value. *The EX500 with integrated datalink is about 40% less expensive compared to the KMD550, and the EX500 with MultiLink is still thousands less than the KMD550. The EX500 has a higher resolution display and a much easier user interface, along with the flexibility of Narrowcast, XM, or MultiLink.*

FlightMax EX500 (Non-Radar Version)		B/K KMD550 (Non-Radar Version)	
			
List Price	\$8,995	List Price	\$7,695
Datalink	Included	KDR510 Datalink	\$5,546
<b>System Price</b>	<b>\$8,995</b>	<b>System Price</b>	<b>\$13,241</b>
TAS/TCAD interface	Included	w/ optional TAS Traffic Card	\$2,000
<b>Total System Price</b>	<b>\$8,995</b>	<b>Total System Price</b>	<b>\$15,241</b>
XMD-076 Receiver for MultiLink Capability	\$3,750	XM and MultiLink Not Available	---
<b>Total System Price</b>	<b>\$12,745</b>	<b>Total System Price</b>	<b>\$15,241</b>

### FlightMax EX500 advantages over KMD 550:

- EX500 has MultiLink Capability (Narrowcast & XM)
- EX500 datalink has full CONUS coverage and no altitude restrictions
- EX500 has high display brightness and high resolution
- EX500 data blocks are fully configurable
- EX500 zoom rate much more responsive
- EX500 allows for JeppView™ (CMax™) Approach Charts. (KMD550 will not show Approach Charts.)
- EX500 costs less, does more

## FlightMax EX500 vs. Bendix/King KMD550

**Non-Radar Aircraft** - Non-radar aircraft will gain huge benefits from having datalink graphical weather on board. It costs about the same as adding a Stormscope, but adds a tremendous amount of additional value. *The EX500 with integrated datalink is about 40% less expensive compared to the KMD550, and the EX500 with MultiLink is still thousands less than the KMD550. The EX500 has a higher resolution display and a much easier user interface, along with the flexibility of Narrowcast, XM, or MultiLink.*

FlightMax EX500 (Non-Radar Version)		B/K KMD550 (Non-Radar Version)	
			
List Price	\$8,995	List Price	\$7,695
Datalink	Included	KDR510 Datalink	\$5,546
<b>System Price</b>	<b>\$8,995</b>	<b>System Price</b>	<b>\$13,241</b>
TAS/TCAD interface	Included	w/ optional TAS Traffic Card	\$2,000
<b>Total System Price</b>	<b>\$8,995</b>	<b>Total System Price</b>	<b>\$15,241</b>
XMD-076 Receiver for MultiLink Capability	\$3,750	XM and MultiLink Not Available	---
<b>Total System Price</b>	<b>\$12,745</b>	<b>Total System Price</b>	<b>\$15,241</b>

### FlightMax EX500 advantages over KMD 550:

- EX500 has MultiLink Capability (Narrowcast & XM)
- EX500 datalink has full CONUS coverage and no altitude restrictions
- EX500 has high display brightness and high resolution
- EX500 data blocks are fully configurable
- EX500 zoom rate much more responsive
- EX500 allows for JeppView™ (CMax™) Approach Charts. (KMD550 will not show Approach Charts.)
- EX500 costs less, does more

## FlightMax EX500 vs. KMD550/850

### Text METAR Comparison

METAR Conditions at KBED (10nm E of 6B6)			
Wind:	180 at 8kts	Cloud cover:	400 feet broken cumulonimbus
Gust:	15kts		11800 feet scattered towering cumulus
Visibility:	7SM	Temp/Dew:	6°C / -9°C
Weather:	none	Altimeter:	30.48 inches

FlightMax EX500 - Provides fully-translated plain English METAR so you can get weather information at a glance. This is much easier to read and understand in a busy cockpit, as opposed to trying to translate an abbreviated-code METAR.

```
METAR KBED 032105Z AUTO
18008KTG15 7SM BKN004 SCT118
06/-09 A3048
```

KMD 550/850 - Displays abbreviated-code METAR (with a translation table in the back of their operator's manual).

A more extensive comparison chart is available on page 20.

## FlightMax EX500 vs. KMD550/850

### Text METAR Comparison

METAR Conditions at KBED (10nm E of 6B6)			
Wind:	180 at 8kts	Cloud cover:	400 feet broken cumulonimbus
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Weather:	none	Altimeter:	30.48 inches

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```
METAR KBED 032105Z AUTO
18008KTG15 7SM BKN004 SCT118
06/-09 A3048
```

KMD 550/850 - Displays abbreviated-code METAR (with a translation table in the back of their operator's manual).

A more extensive comparison chart is available on page 20.

FlightMax EX500 vs. KMD550/850

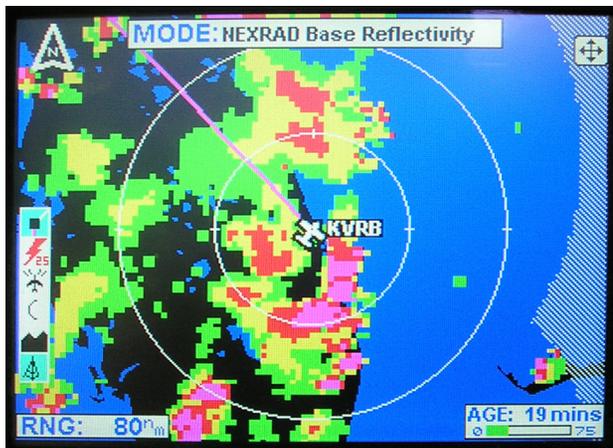


EX500 Screen shot with high resolution depiction of weather.

FlightMax EX500 vs. KMD550/850



EX500 Screen shot with high resolution depiction of weather.



KMD850 screen shot with their depiction of weather.



KMD850 screen shot with their depiction of weather.

## FlightMax EX500 vs. MX20

**Radar-Equipped Aircraft** – As mentioned before, the FlightMax EX500 supports 19 different radars, so in most cases, you won't need to replace your existing radar R/T, making the FlightMax EX500 the easy choice. The MX20 *only* works with the RDR 2000 series radars, and costs thousands more than the EX500. The FlightMax EX500 is the hands-down winner on price and functionality here as well. *The radar-capable EX500 costs about 40% less than the MX20 I/O with a WSI AV200. The EX500 with XM/MultiLink is still 20% less.*

FlightMax EX500 w/ RDR 2000 Radar Interface		UPS/GARMIN-AT MX20 I/O w/RDR 2000 Radar Interface	
			
List Price	\$11,995	List Price	\$14,995
Datalink	Included	WSI AV200 Datalink	\$4,995
TAS/TCAD interface	Included	TAS Interface	Included
<b>Total System Price</b>	<b>\$11,995</b>	<b>Total System Price</b>	<b>\$19,990</b>
XMD-076 Receiver for MultiLink Capability	\$3,750	XM and MultiLink Not Available	---
<b>Total System Price</b>	<b>\$15,745</b>	<b>Total System Price</b>	<b>\$19,990</b>

### FlightMax EX500 Advantages over the MX20 I/O:

- EX500 has MultiLink Capability (Narrowcast & XM)
- EX500 can overlay radar AND datalink on map
- EX500 supports curved flight paths
- EX500 data blocks are fully configurable
- EX500 user interface for radar is much easier (dedicated Tilt & Brg Knob)
- EX500 zoom rate much more responsive
- EX500 costs less, does more

## FlightMax EX500 vs. MX20

**Radar-Equipped Aircraft** – As mentioned before, the FlightMax EX500 supports 19 different radars, so in most cases, you won't need to replace your existing radar R/T, making the FlightMax EX500 the easy choice. The MX20 *only* works with the RDR 2000 series radars, and costs thousands more than the EX500. The FlightMax EX500 is the hands-down winner on price and functionality here as well. *The radar-capable EX500 costs about 40% less than the MX20 I/O with a WSI AV200. The EX500 with XM/MultiLink is still 20% less.*

FlightMax EX500 w/ RDR 2000 Radar Interface		UPS/GARMIN-AT MX20 I/O w/RDR 2000 Radar Interface	
			
List Price	\$11,995	List Price	\$14,995
Datalink	Included	WSI AV200 Datalink	\$4,995
TAS/TCAD interface	Included	TAS Interface	Included
<b>Total System Price</b>	<b>\$11,995</b>	<b>Total System Price</b>	<b>\$19,990</b>
XMD-076 Receiver for MultiLink Capability	\$3,750	XM and MultiLink Not Available	---
<b>Total System Price</b>	<b>\$15,745</b>	<b>Total System Price</b>	<b>\$19,990</b>

### FlightMax EX500 Advantages over the MX20 I/O:

- EX500 has MultiLink Capability (Narrowcast & XM)
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- EX500 data blocks are fully configurable
- EX500 user interface for radar is much easier (dedicated Tilt & Brg Knob)
- EX500 zoom rate much more responsive
- EX500 costs less, does more

## FlightMax EX500 vs. MX20

**Non-Radar Aircraft** - The EX500 with integrated datalink has a much easier user interface and is about 30% less expensive compared to the MX20 w/AV200. *The EX500 with XM/MultiLink still costs less and it has a much easier user interface and higher performance.*

FlightMax EX500 (Non-Radar Version)		UPS/GARMIN-AT MX20 (Non-Radar Version)	
			
List Price	\$8,995	List Price	\$7,295
Datalink	Included	WSI AV200 Datalink	\$4,995
<b>System Price</b>	<b>\$8,995</b>	<b>System Price</b>	<b>\$12,290</b>
TAS/TCAD interface	Included	w/ optional TAS Traffic Card	\$1,200
<b>Total System Price</b>	<b>\$8,995</b>	<b>Total System Price</b>	<b>\$13,490</b>
XMD-076 Receiver for MultiLink Capability	\$3,750	XM and MultiLink Not Available	---
<b>Total System Price</b>	<b>\$12,745</b>	<b>Total System Price</b>	<b>\$13,490</b>

### FlightMax EX500 Advantages over the MX20:

- EX500 has MultiLink Capability (Narrowcast & XM)
- EX500 supports curved flight paths
- EX500 data blocks are fully configurable
- EX500 zoom rate much more responsive
- EX500 costs less, does more

## FlightMax EX500 vs. MX20

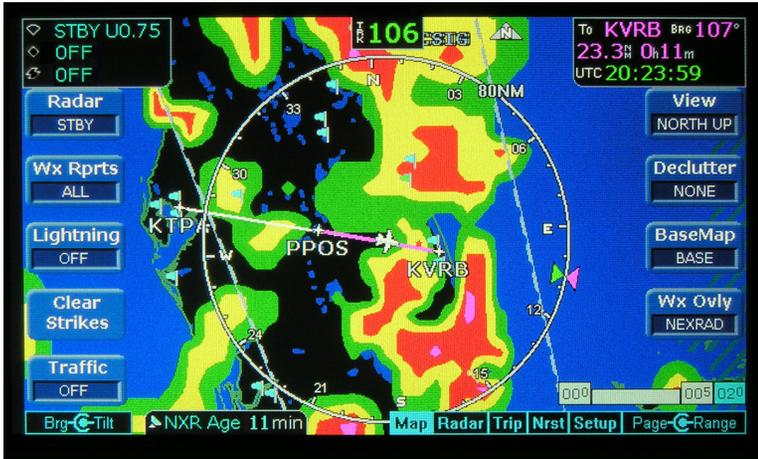
**Non-Radar Aircraft** - The EX500 with integrated datalink has a much easier user interface and is about 30% less expensive compared to the MX20 w/AV200. *The EX500 with XM/MultiLink still costs less and it has a much easier user interface and higher performance.*

FlightMax EX500 (Non-Radar Version)		UPS/GARMIN-AT MX20 (Non-Radar Version)	
			
List Price	\$8,995	List Price	\$7,295
Datalink	Included	WSI AV200 Datalink	\$4,995
<b>System Price</b>	<b>\$8,995</b>	<b>System Price</b>	<b>\$12,290</b>
TAS/TCAD interface	Included	w/ optional TAS Traffic Card	\$1,200
<b>Total System Price</b>	<b>\$8,995</b>	<b>Total System Price</b>	<b>\$13,490</b>
XMD-076 Receiver for MultiLink Capability	\$3,750	XM and MultiLink Not Available	---
<b>Total System Price</b>	<b>\$12,745</b>	<b>Total System Price</b>	<b>\$13,490</b>

### FlightMax EX500 Advantages over the MX20:

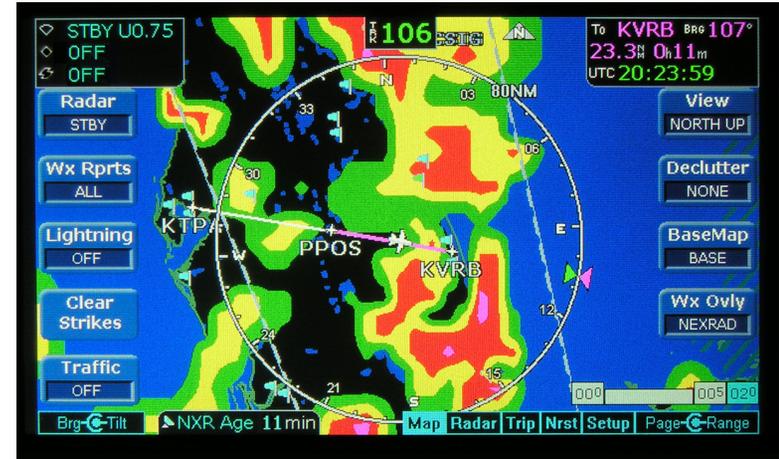
- EX500 has MultiLink Capability (Narrowcast & XM)
- EX500 supports curved flight paths
- EX500 data blocks are fully configurable
- EX500 zoom rate much more responsive
- EX500 costs less, does more

## FlightMax EX500 vs. MX20

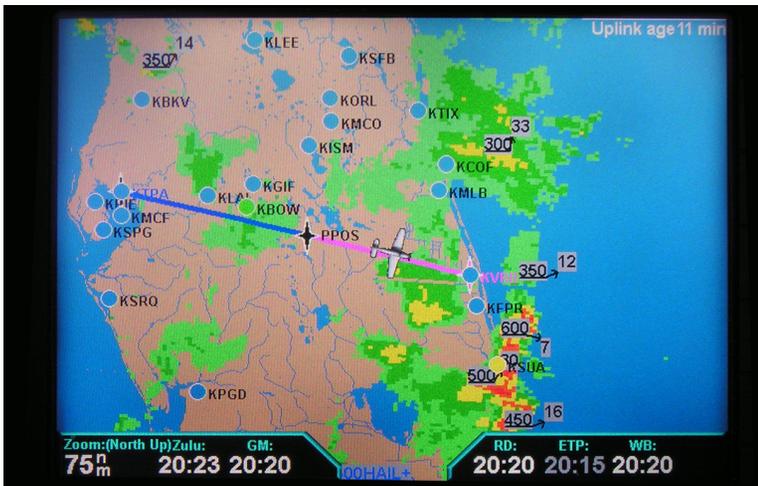


EX500 Screen shot with high resolution depiction of NEXRAD weather and METARs.

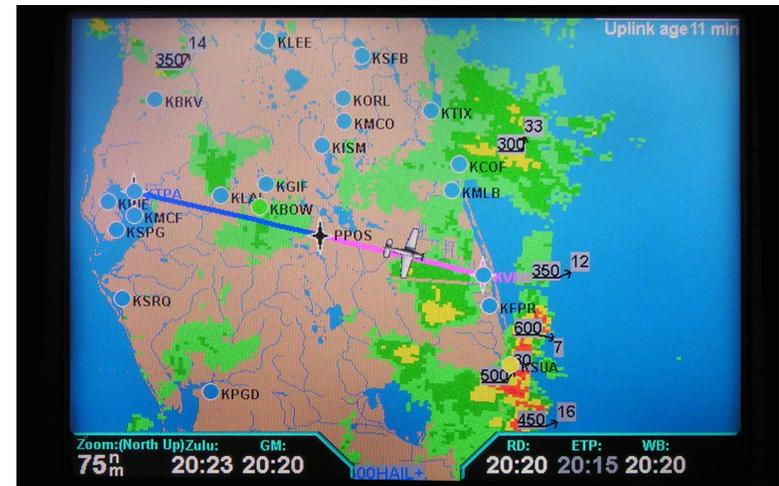
## FlightMax EX500 vs. MX20



EX500 Screen shot with high resolution depiction of NEXRAD weather and METARs.



MX20 screen shot depicting datalink weather.



MX20 screen shot depicting datalink weather.

## FlightMax EX500 vs. Garmin GNS530

Customers trying to decide whether to get a Garmin 530 w/GDL49 or a FlightMax EX500 should consider this. You are probably looking at the 530 because you want to add a more capable GPS, and you may be wanting to upgrade your NAV/COMM unit.

In this case, it makes more sense to choose the FlightMax EX500 with integrated datalink and couple it with a Garmin 430. You'll get the same GPS/NAV/COMM capability as the 530, plus you'll have the absolute best moving map available today with the EX500. And you will also get the advantage of Avidyne's integrated Narrowcast Datalink, rather than having to also buy a GDL49 datalink box with its higher-workload request-reply datalink system. And with the EX500, you have the ability to add the XMD-076 and XM WX Satellite Weather Service and MultiLink capability.

The EX500 also provides full color-contoured terrain base map and a full US obstacle database, which are not available on the 430 or 530. And you get a much higher resolution display. **The EX500 has over twice as many pixels and 50% more screen area than the GNS530, which means you can overlay your flight plan, terrain, water, off-route nav aids, airways, AND weather without having to switch to different screens.**

Plus, if you have a radar indicator, the EX500 (with 19 different radar interfaces) will more than likely act as a replacement, whereas the 530 will not display radar.

## FlightMax EX500 vs. Garmin GNS530

Customers trying to decide whether to get a Garmin 530 w/GDL49 or a FlightMax EX500 should consider this. You are probably looking at the 530 because you want to add a more capable GPS, and you may be wanting to upgrade your NAV/COMM unit.

In this case, it makes more sense to choose the FlightMax EX500 with integrated datalink and couple it with a Garmin 430. You'll get the same GPS/NAV/COMM capability as the 530, plus you'll have the absolute best moving map available today with the EX500. And you will also get the advantage of Avidyne's integrated Narrowcast Datalink, rather than having to also buy a GDL49 datalink box with its higher-workload request-reply datalink system. And with the EX500, you have the ability to add the XMD-076 and XM WX Satellite Weather Service and MultiLink capability.

The EX500 also provides full color-contoured terrain base map and a full US obstacle database, which are not available on the 430 or 530. And you get a much higher resolution display. **The EX500 has over twice as many pixels and 50% more screen area than the GNS530, which means you can overlay your flight plan, terrain, water, off-route nav aids, airways, AND weather without having to switch to different screens.**

Plus, if you have a radar indicator, the EX500 (with 19 different radar interfaces) will more than likely act as a replacement, whereas the 530 will not display radar.

## FlightMax EX500 vs. Garmin GNS530

FlightMax EX500 w/GNS430 GPS/NAV/COMM		Garmin GNS530 w/GPS/NAV/COMM	
			
List Price	<b>\$8,995</b>	List Price	<b>\$14,995</b>
Narrowcast Datalink	Included	GDL 49 Datalink	\$3,450
TAS/TCAD interface	Included	TAS/TCAD interface	Included
Terrain Database	Included	Terrain Database	Not Available
Obstacle Database	Included	Obstacle Database	Not Available
GNS430 GPS/NAV/COM	\$9,250	(Functionality included in 530)	---
<b>Total System Price</b>	<b>\$18,245</b>	<b>Total System Price</b>	<b>\$18,445</b>
XMD-076 Receiver for MultiLink Capability	\$3,750	MultiLink Not Available	---
<b>Total System Price</b>	<b>\$21,995</b>	<b>Total System Price</b>	<b>\$18,445</b>

### FlightMax EX500 Advantages over the GNS 530:

- EX500 has MultiLink Capability (Narrowcast & XM)
- EX500 can overlay radar and datalink Wx on map
- EX500 shows color-contoured terrain, the 530 does not  
(Terrain is a \$6,400 option on 530 when available)
- EX500 shows man-made obstacles, 530 does not
- EX500 has higher display brightness
- EX500 has higher resolution display  
(The EX500 has over twice as many pixels and 50% more screen area.)
- EX500 zoom rate much more responsive
- EX500 allows for JeppView™ (CMax™) Approach Charts.  
(GNS530 will not do Approach Charts.)

## FlightMax EX500 vs. Garmin GNS530

FlightMax EX500 w/GNS430 GPS/NAV/COMM		Garmin GNS530 w/GPS/NAV/COMM	
			
List Price	<b>\$8,995</b>	List Price	<b>\$14,995</b>
Narrowcast Datalink	Included	GDL 49 Datalink	\$3,450
TAS/TCAD interface	Included	TAS/TCAD interface	Included
Terrain Database	Included	Terrain Database	Not Available
Obstacle Database	Included	Obstacle Database	Not Available
GNS430 GPS/NAV/COM	\$9,250	(Functionality included in 530)	---
<b>Total System Price</b>	<b>\$18,245</b>	<b>Total System Price</b>	<b>\$18,445</b>
XMD-076 Receiver for MultiLink Capability	\$3,750	MultiLink Not Available	---
<b>Total System Price</b>	<b>\$21,995</b>	<b>Total System Price</b>	<b>\$18,445</b>

### FlightMax EX500 Advantages over the GNS 530:

- EX500 has MultiLink Capability (Narrowcast & XM)
- EX500 can overlay radar and datalink Wx on map
- EX500 shows color-contoured terrain, the 530 does not  
(Terrain is a \$6,400 option on 530 when available)
- EX500 shows man-made obstacles, 530 does not
- EX500 has higher display brightness
- EX500 has higher resolution display  
(The EX500 has over twice as many pixels and 50% more screen area.)
- EX500 zoom rate much more responsive
- EX500 allows for JeppView™ (CMax™) Approach Charts.  
(GNS530 will not do Approach Charts.)

## FlightMax EX500 vs. Garmin GNS530

## FlightMax EX500 vs. Garmin GNS530



EX500 Screen shot with high resolution (1 sq. mi.) depiction of weather.



EX500 Screen shot with high resolution (1 sq. mi.) depiction of weather.



GNS 530 Datalink Screen shot of same weather. Notice the large blocky presentation of weather due to the lower resolution (36 sq. mi.), which might cause you to deviate much more than needed.



GNS 530 Datalink Screen shot of same weather. Notice the large blocky presentation of weather due to the lower resolution (36 sq. mi.), which might cause you to deviate much more than needed.

## Datalink Comparison Chart

	FlightMax EX500	Bendix/King KMD 550/850	Garmin GNS530	Garmin-AT MX20
Datalink Provider	XM WX & Avidyne	B/K FIS-B	Echo Flight	WSI
Non-Radar MFD w/Datalink and TAS interface	\$8,995	\$15,241	\$18,500	\$13,490
MultiLink Non-Radar MFD w/XM & TAS interface	\$12,745	Not Available	Not Available	Not Available
MFD System Price w/ RDR2000 Radar, Datalink & TAS	\$11,995	\$19,954	Not Available	\$19,990
MultiLink MFD System w/ RDR2000 Radar, XM & TAS	\$15,745	Not Available	Not Available	Not Available
Highest NEXRAD Resolution	1.0 nm (1.0 Sq nm)	2.16 nm (4.6 Sq. nm)	6.0 nm (36 Sq. nm)	1.0 nm (1.0 Sq nm)
All-altitude coverage and full CONUS coverage	Yes	No	Yes	Yes
Display Resolution	High	Low	Low	High
Display Brightness	High	Med	Med	High
Easy User Interface for Weather Updates	Automatic Update	Automatic Update	Request Reply	Auto Update
Graphical METARs	Yes	Yes	Yes	Yes
Plain English METARs	Yes	No	No	Yes
Full Overlay	Yes	No	No	No
TFR Updates	Yes	No	No	Yes
Dedicated Radar Range, Tilt & Bearing Knobs	Yes	Yes	N/A	No
XYZ Heading input	Yes	Requires \$2K interface card	Requires \$3500 GAD 42	No
TAWS support	Yes \$2K Option + Sensor	Yes \$2K Option + Sensor	Yes \$6.4K Upgrade mid-2004	No
JeppView™ Approach Chart Support	Yes (CMax™)	No	No	Yes (ChartView)
Support for RDR130/150/160 Radar	Yes	No	No	No
Support for Collins WXR250/270 and Bendix 1100/12200 Radars	Yes	No	No	No
Subscription Fees	\$49/Month for XM "Pay-as-you go" Narrowcast	\$49-55/ Month \$588-\$660/year	\$9 - \$55/ Month \$108 -\$660/year	\$50-85/Month \$600 - \$1000/year
Comparison data based on available website data as of July 2004 and is subject to change.				

## Datalink Comparison Chart

	FlightMax EX500	Bendix/King KMD 550/850	Garmin GNS530	Garmin-AT MX20
Datalink Provider	XM WX & Avidyne	B/K FIS-B	Echo Flight	WSI
Non-Radar MFD w/Datalink and TAS interface	\$8,995	\$15,241	\$18,500	\$13,490
MultiLink Non-Radar MFD w/XM & TAS interface	\$12,745	Not Available	Not Available	Not Available
MFD System Price w/ RDR2000 Radar, Datalink & TAS	\$11,995	\$19,954	Not Available	\$19,990
MultiLink MFD System w/ RDR2000 Radar, XM & TAS	\$15,745	Not Available	Not Available	Not Available
Highest NEXRAD Resolution	1.0 nm (1.0 Sq nm)	2.16 nm (4.6 Sq. nm)	6.0 nm (36 Sq. nm)	1.0 nm (1.0 Sq nm)
All-altitude coverage and full CONUS coverage	Yes	No	Yes	Yes
Display Resolution	High	Low	Low	High
Display Brightness	High	Med	Med	High
Easy User Interface for Weather Updates	Automatic Update	Automatic Update	Request Reply	Auto Update
Graphical METARs	Yes	Yes	Yes	Yes
Plain English METARs	Yes	No	No	Yes
Full Overlay	Yes	No	No	No
TFR Updates	Yes	No	No	Yes
Dedicated Radar Range, Tilt & Bearing Knobs	Yes	Yes	N/A	No
XYZ Heading input	Yes	Requires \$2K interface card	Requires \$3500 GAD 42	No
TAWS support	Yes \$2K Option + Sensor	Yes \$2K Option + Sensor	Yes \$6.4K Upgrade mid-2004	No
JeppView™ Approach Chart Support	Yes (CMax™)	No	No	Yes (ChartView)
Support for RDR130/150/160 Radar	Yes	No	No	No
Support for Collins WXR250/270 and Bendix 1100/12200 Radars	Yes	No	No	No
Subscription Fees	\$49/Month for XM "Pay-as-you go" Narrowcast	\$49-55/ Month \$588-\$660/year	\$9 - \$55/ Month \$108 -\$660/year	\$50-85/Month \$600 - \$1000/year
Comparison data based on available website data as of July 2004 and is subject to change.				

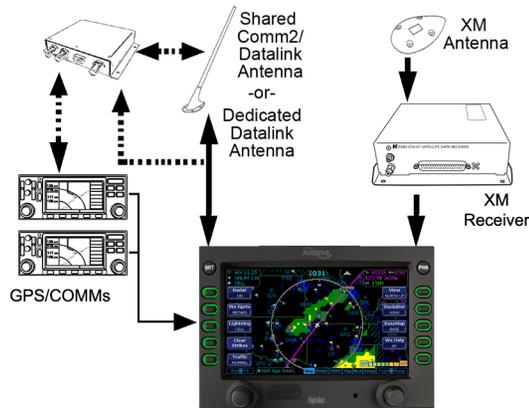
## Best Value - Installation Cost

Avionics installation costs vary from dealer to dealer, but many of the issues that drive cost are constant across all installation centers. When quoting the installation of a piece of gear or an avionics system, avionics managers typically look at the following items:

How much rearranging of the panel will be required to add this piece of gear? How many boxes are required to make this piece of gear work? (Is this a one-box system, a two-box system? etc). Do I need to install another antenna on the aircraft? Do I need to punch another hole in the skin to add the antenna? (This is particularly important for pressurized aircraft).

The FlightMax EX500 is typically the least expensive system to install because it can be installed as a one-box system, due to the fact that the datalink transceiver built right into the MFD. That means only one hole to cut in the panel, wires only need to go to one box, and it typically only requires one circuit breaker. In radar-equipped aircraft where the EX500 replaces the existing radar indicator, panel space rearrangement is minimal. Another big advantage of the FlightMax EX500 system is that Avidyne offers the option of a FlightMax DC50 antenna coupler, which allows the datalink transceiver in the EX500 to time-share a single antenna. With the DC50, avionics installers replace the existing top-mounted COMM2 antenna with a new dual-purpose "COMM/DAT" antenna, which provides extended-range VHF capability for communicating over the normal VHF COMM band as well as the higher VHF satellite frequencies.

Installing an XM receiver for MultiLink capability is equally easy because the compact size of the XMD-076 provides for a variety of mounting options. Antenna manufacturer, COMANT Industries is expanding its line of multi-purpose antennas to include XM functionality which will also reduce the number of antennas required.



This diagram shows an EX500 MultiLink installation with a dedicated XM antenna and a shared VHF/ORBCOMM antenna.

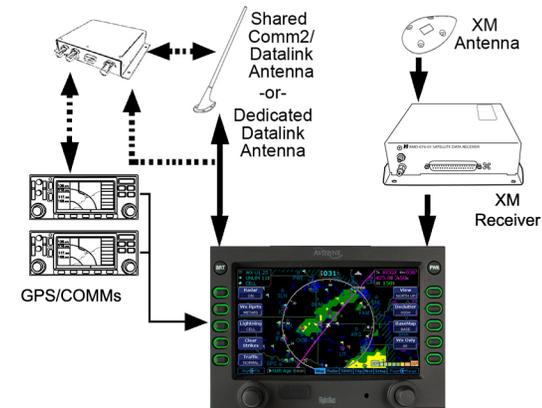
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## Recurring Cost (Service)

### Now you have a choice

One of the big questions surrounding datalink is the recurring charges for service. It is important to have the option of choosing a flat-rate subscription, or a lower cost pay-as-you-go plan so you are only paying for the data you need.

How much you fly will guide your decision on which service plan is right for you. Subscription-based pricing plans are designed to bill you a fixed amount monthly or annually. If you fly more than 150 hours per year, subscription pricing may be the best plan for you. If you operate your aircraft less than 150 hours per year, you probably don't mind paying for datalink weather when the need arises, but you appreciate the ability to turn off the datalink in VFR conditions, without having to worry about a bill for the months when you are not flying.

As mentioned before, Avidyne's Narrowcast system has the advantage of a "pay-as-you-go" service which makes it the lowest cost datalink optional available. With Narrowcast, Avidyne only gets billed when we pass data through ORBCOMM satellites. ORBCOMM does not charge us an over-and-above fee to help pay for the infrastructure. This provides Avidyne with the flexibility to offer "pay-as-you-go" service for low-time flyers who might not use their airplane for weeks or months at a time and don't want to be burdened with the recurring costs of an annual subscription. An "unlimited" service is also available for Narrowcast customers who fly more often.

Broadcast systems such as XM WX use a subscription pricing model which currently costs \$49, and offers high-speed data as often as you need it. Other broadcast systems offer similar plans at \$50 to \$80 per month.

With Avidyne's MultiLink service, you will have a subscription for the XM broadcast service, which will be the primary means of getting your weather, and you will also have the optional "pay-as-you-go" Narrowcast service, which can be configured so that you will only be billed when you fly outside the CONUS or when you want to send two-way messages.

With Avidyne, you have the choice.

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## With MultiLink, we're just getting started.

Avidyne's MultiLink datalink service is revolutionizing the way we communicate with our aircraft and the ground. The high-speed broadcast capability of XM WX provides incredible update rates not attainable until just recently, including five-minute updates of NEXRADs, and lightning updates from the National Lightning Detection Network®. It's wide-band capability makes it easy to add future weather services such as cloud tops, and icing information. Coupled with Avidyne's exclusive two-way Narrowcast capability, MultiLink provides the best of both technologies. Once you've established a two-way link to the airplane, numerous opportunities become available to provide additional situational data and safety products. Future products such as position reporting, maintenance data downlink, flight plan uplink, and database updating via datalink will become available as well. These products take advantage of the two-way communication path possible with Avidyne's satellite network. As additional products become available, we will update our web portal to allow user selection and display integration.

## Can I afford datalink on my airplane?

The question is can you afford not to have datalink on your airplane. We think datalink is so practical and affordable that we have integrated a datalink transceiver into every EX500 we make. Compare the costs and features of the competing systems. Avidyne's integrated approach saves you money in both avionics cost and installation. Considering the utility, safety and economic implications of real time weather in the cockpit, you should **expect** datalink as standard equipment in your avionics.

With FlightMax, the complete weather picture is displayed as an overlay on the map, with your flight plan, traffic, terrain, obstacles, and TFRs making it possible to avoid the weather with complete situational awareness anywhere in the continental United States. Our high-performance processing and integrated graphics architecture allow simultaneous real-time display of all the situational data available. With Avidyne's MultiLink datalink weather system, you can have the most advanced datalink system available, at the greatest value.

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