# Multi-Function Display Pilot's Guide Addendum



## Software Release 4.2 or Later

AVIDYNE™

# Document Revision History

| Date | Revision | Description |
|---|---|---|
| February 21, 2018 | 00 | Initial Release |
| November 01, 2018 | 01 | Changes made in conjunction with software update 8.2.1 |

This document is applicable to the following part numbers:

- Software Part Numbers: 530-00235-800 and 530-00235-900
- Hardware Part Number 700-00007-() and 700-00167-().
- Pilot Guide Part Number: 600-00078-001

# 1. Introduction

## 1.1 About this Guide

This guide includes information related to the changes through EX500 and EX600 Release 4.2.1 from Release 4.0.  Unless described in this pilot guide addendum, all functions of the EX500 and EX600 Release 4.0 remain unchanged.  If there are conflicts between the data in the Release 4.0 pilot's guide and this Release 4.2.1 pilot's guide addendum, the data in this addendum should be used.

| NOTE |
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| All images contained within this document, including screenshots and other displays, are for reference use only and are subject to change. The images contained herein may differ slightly from your actual equipment or display. |

**MLX770 Iridium 2-way  Datalink is no longer supported.**
**MLB700 Broadcast Datalink is no longer supported.**

## 2. Map Page (TWX Display)

**IMPORTANT NOTE**

Some TWX670 cell data may not be displayed when the map orientation is not in the heading up view. As an example (below), with the map range set at 10NM the cell data used from the TWX sensor is 10NM which may cause areas of the screen to be uncovered when in North-Up center view and the aircraft directional orientation is not North Up. There is no indication on the MFD screen that TWX data is not available in these regions. The left and right sides of a landscape display in centered heading-up mode may not receive TWX cells. Also, if the screen is rotated with the aircraft heading (e.g., in north up mode), the corners of the display may not receive TWX cells.

**Example of TWX670 clipping**

# 3. Datalink

## 3.1 FIS-B Information Via ADS-B Network

### 3.1.1 US ADS-B Weather (FIS-B Datalink)

FIS-B datalink is a transmission to your aircraft via the ADS-B network. FIS-B Datalink is a subscription free product provided from the FAA to an ADS-B receiver that receives weather data when in range of an ADS-B ground station(s). With Release 4.2 (or later) and an ADS-B receiver, the EX500/600 can display ADS-B weather and traffic.

FIS-B information may be used for pilot planning decisions focused on updating the pilot's awareness of the dynamic flight environment; including avoiding areas of inclement weather that are beyond visual range and pilot near term decisions where poor visibility precludes visual acquisition of inclement weather. FIS-B weather and NAS status information may be used as follows:

1.  To promote pilot awareness of ownship location with respect to reported weather, including hazardous meteorological conditions; NAS status indicators to enhance pilot planning decisions; and pilot near-term decision-making.

2.  To cue the pilot to communicate with Air Traffic Control, Flight Service Station specialist, operator dispatch, or airline operations control center for general and mission critical meteorological information, NAS status conditions, or both.

FIS-B information, including weather information, NOTAMs, and TFR areas, are intended for the sole purpose of assisting in long-/near-term planning and decision making. The system lacks sufficient resolution and updating capability necessary for aerial maneuvering associated with immediate decisions. In particular, in extreme scenarios, the oldest weather radar data on the display can be up to 15 to 20 minutes older than the display's age indication for that weather radar data. Therefore, do not attempt to use FIS-B weather information to maneuver the aircraft at minimum safe distances from hazardous weather. FIS-B information must not be used in lieu of a standard preflight briefing.

FIS-B weather radar data coverage areas can be very irregular shaped areas – the geometry is dependent on how many transmission sites are in view and how much data has been received by the on-board receiver. At large map ranges beyond 250 NM from the aircraft, small areas of high-intensity RADAR returns may not be displayed; instead, larger areas of surrounding lower-intensity RADAR returns will be shown. If FIS-B weather radar is unavailable in a particular area for any reason, hatched lines appear in that area.

> **NOTE**
>
> FIS-B uplink is an FAA approved source for METAR, TAF, WINDs, PIREPs, NEXRAD, AIRMET, SIGMET and TFR information subject to the range limits for the broadcast of these products. FIS-B is not an FAA approved source for NOTAMs.

## 3.1.2  US ADS-B Weather (FIS-B) on the Map page

You can control the different weather products overlaid on the moving map. One of those weather products is a composite radar image. The FIS-B weather radar is composed of a composite image depicting precipitation as seen by multiple ground-based weather radar sites. The image is color-coded to show intensity levels. There are two different NEXRAD radar image products that can be displayed, CONUS radar (US RDR) or Regional Radar (LOC RDR).

The "Wx Ovly" key on the map page allows the user to cycle through different layer combinations as well as turning the weather overlay off all together. The options available are:

- US RDR - CONUS Radar
- LOC RDR - Regional Radar
- Radar (if onboard radar enabled)
- DSPLY OFF

When the "Wx Ovly" key on the map page has selected Regional Radar (LOC RDR) and a map range greater than 750 NM is selected, the Regional Radar imagery is removed until a map range less than or equal to 750 NM is selected. When valid Regional Radar imagery is removed at map ranges greater than 750 NM, the status block displays "LOC Rdr Rmvd >750 NM".

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**NOTE**

**ADS-B (FIS-B) US Weather Radar Data is Coarse** When compared to subscription Datalink service data and even ADS-B Regional data, the CONUS weather radar data appears as a noticeably coarser depiction – this is a function of the supplied data.

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**IMPORTANT NOTE**

When operating in areas in the vicinity of the International Dateline, the MFD FIS-B NEXRAD imagery may not display when in center view. If NEXRAD imagery is not displaying, change to the North up view.

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In addition to the weather radar overlay options, the map page can display graphical representations of METARs (flags), SIGMETs and AIRMETs. The "Wx Rprts" key on the map page cycles through the layer combinations that can be "turned on or off". Those options are:

- METARS
- SIGMET
- AIRMET
- ALL
- DSPLY OFF
- Off

### 3.1.3 US ADS-B Weather (FIS-B) Information on the Trip Page

On the trip page, the "Display" key provides a means to control display of other weather-related data below the flight plan. The choices include: "METAR", "TAF", "WINDS", "AIR/SIG", "TFR" "LEGEND", "STATUS".

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

*METAR*
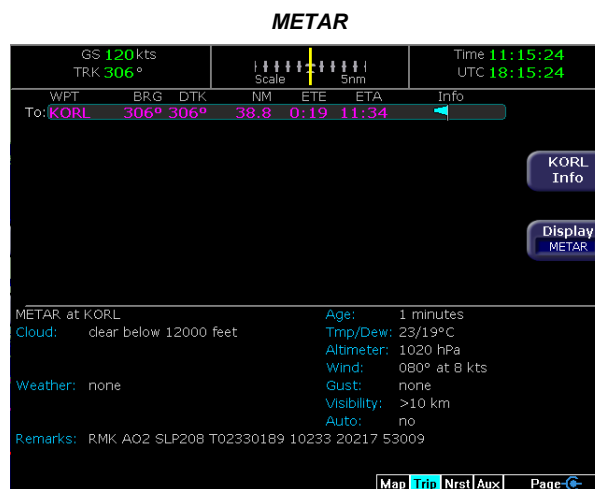


- **TAFs** – These are available as a text format and represent forecasted surface weather observations. Text TAFs are presented on the "TRIP" page by cycling the "DISPLAY" button until "TAF" appears. A TAF icon will appear under the "Info" column of the trip page if a TAF is available for that station.
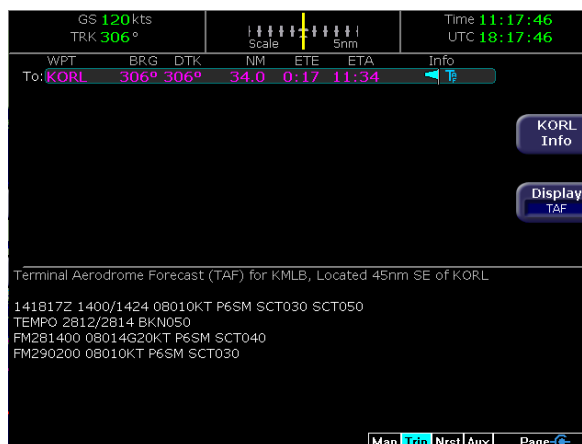
- **WINDS** – These are available as a text format and represent forecasted winds aloft. Textual winds aloft are presented on the "TRIP" page by cycling the "DISPLAY" button until "WINDS" appears. The forecast periods available and displayed are 6-hour, 12-hour and 24-hour. They can be controlled by using the "FORECAST" LSK. A wind barb icon will appear under the "Info" column of the trip page if winds aloft are available for that station.
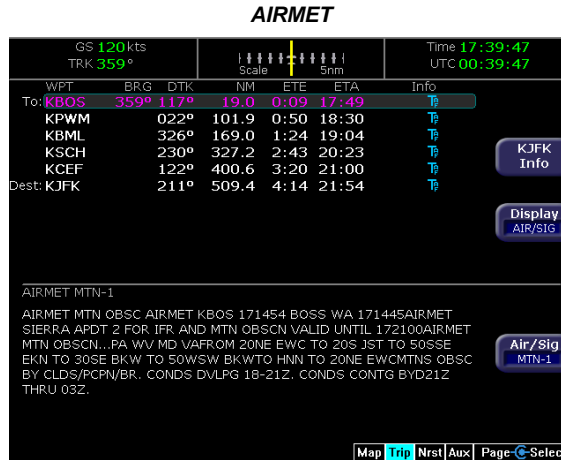


- **AIRMETs and SIGMETs (US only)** – These are areas which the National Weather Service has issued advisories for various types of hazardous weather. They are depicted on the Map page along with an abbreviated description of the hazard, such as "ICE" (icing), "MTN" (mountain obscuration), or "IFR" (instrument flight conditions). AIRMET & SIGMET labels  number. AIRMETs and SIGMETs are also available textually on the TRIP page by pressing the "DISPLAY" LSK until AIR/SIG appears. To cycle between the available AIR/SIGMETs, press the AIR/SIG LSK.

*SIGMET*

*AIRMET*



- **TFRs** –A Temporary Flight Restriction (TFR) is a type of Notices to Airmen (NOTAM). A TFR defines an area restricted to air travel due to a hazardous condition, a special event, or a general warning for the entire FAA airspace. The text of the actual TFR contains the fine points of the restriction and can be found on the Trip page. The number of the TFR found on the map page correlates to the number found on the Trip page.

  There are two types of TFRs depicted – active and pending. Active TFRs are depicted as solid red lines and Pending TFRs are depicted as dashed red lines, which become solid when the TFR transition time rolls from pending to active. TFRs can change in a short period of time, it is strongly recommended for the pilot to obtain the latest information through other approved sources for their operation.

*TFR*
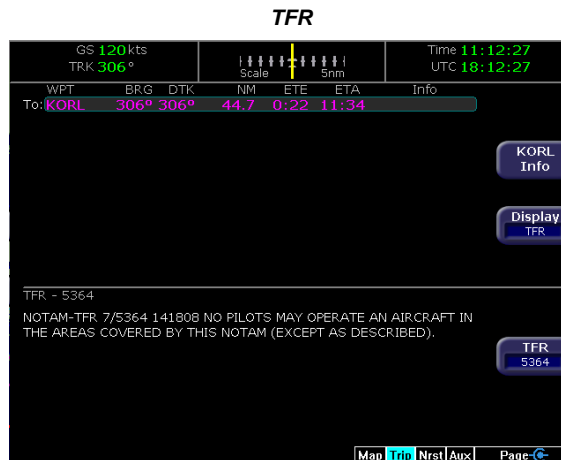


| IMPORTANT NOTE |
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| **TFR** information should always be obtained and verified via other approved sources. Not all active TFRs are broadcast in the ADS-B network. |

- **LEGEND** – The legend defines the various symbols used in the FIS-B data depictions on the maps.
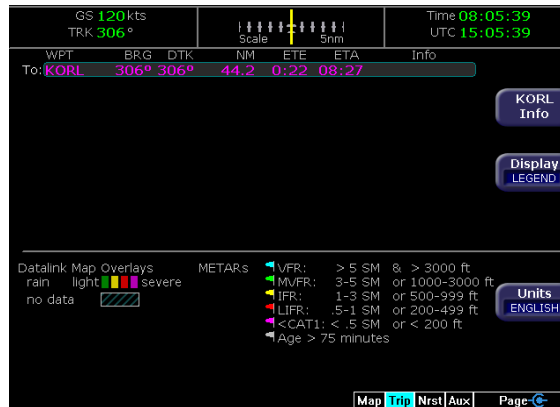


- **STATUS** – There are 3 sections within the status page, Stations, Products and Unavailable Products that provide details on station information, weather products received and weather products that are marked as unavailable by the ADS-B Network.
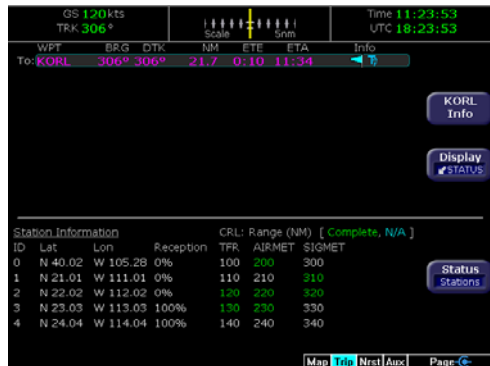
*Stations w/info*                                           *Products w/age*

  

*Unavailable Products*

## 3.2 Indications of Data Age (ADS-B FIS-B and Datalink)

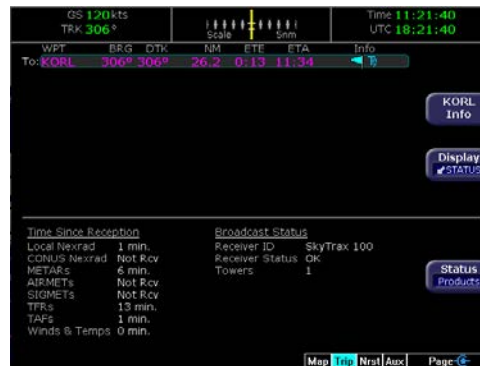As noted above, there are multiple weather products that are transmitted as part of the ADS-B network or Broadcast Datalink. The weather products can be received at different rates; therefore two locations where information on age of received products can be identified. The corner of the map page displays the age of the NEXRAD radar data mosaic. The trip page also has a Products section that indicates each weather product and the time since it was last received.

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**IMPORTANT NOTE**

Pilots must monitor the age of the data in assessing its reliability. The in-cockpit weather received by either Broadcast Datalink or the ADS-B network depicts where the weather WAS, not where it IS. The age indicator does not show the age of the actual weather conditions but rather the age of the mosaic image. The actual weather conditions could be up to 15 to 20 minutes OLDER than the age indicated on the display. Pilots should consider this potential delay when using in-cockpit weather received via the two networks and its capabilities, as the movement and/or intensification of weather could adversely affect safety of flight.

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**NOTE**

If the ADS-B receiver is not communicating to the MFD for more than 15 seconds after startup or 5 seconds after having successfully communicated, a message of "FIS-B Receiver Not Communicating" will appear. Visit your Avidyne approved dealer for troubleshooting and/or repair.

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# 4. Traffic

As with any traffic device, it is ultimately the pilots responsibility to see and avoid traffic. If GPS position is not available, traffic will be removed from the map page and will not show on the dedicated traffic page. A traffic alert message will still appear in the Message Bar with bearing, relative altitude and distance. In addition to the yellow traffic alert message, the traffic page will have "Traffic Display Not Available Without GPS" in the center display.

*GPS Unavailable and Traffic Alert*
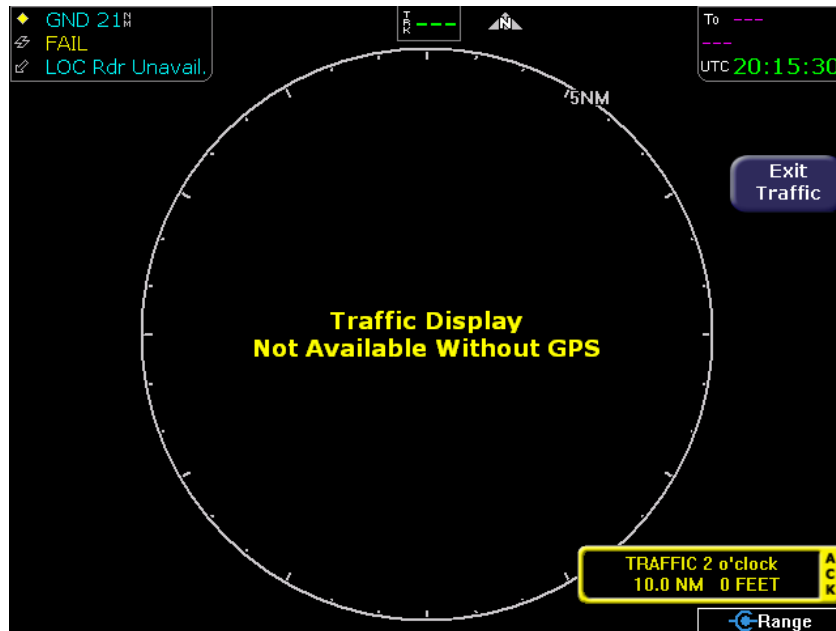


## 4.1.1 ADS-B traffic

The ADS-B traffic effective range is 40 NM from the aircraft location. There are 5 different display options for ADS-B received traffic: ABOVE, NORMAL, UNLIMITD and BELOW. If the user does not want to display any ADS-B traffic, DSPLY OFF can be selected and will remove any traffic from the map. Below is examples of traffic symbology when connected to an ADS-B receiver.

*Traffic Symbols w/ADS-B Receiver*

| Symbol | Type | Meaning |
|---|---|---|
| | Traffic Alert (TA) (with intruder track) | Traffic that is within the alert zone defined by the traffic sensor. |
| | Proximate Traffic (without intruder track) | Traffic that is not within an alert zone but is close to your position. |
| | Other Traffic (with intruder track) | Traffic that is detected by the traffic sensor, but determined not to be a current threat. |

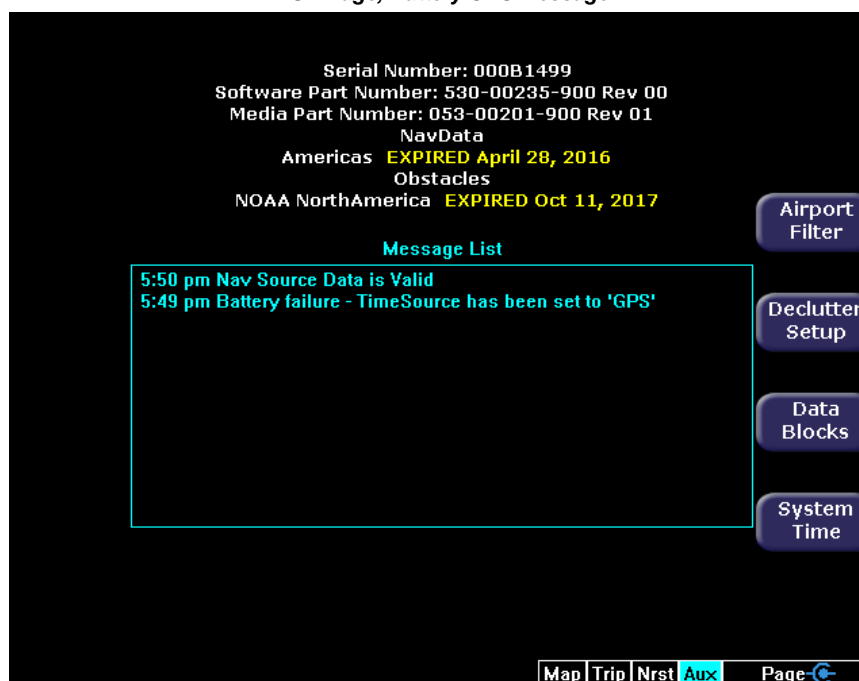## 5. MFD CMOS Battery Operation and Replacement

### 5.1 CMOS Battery

A CMOS (Complementary Metal-Oxide Semiconductor) battery is used in the EX500/600 Series of MFDs to maintain the system clock. On average, CMOS batteries have been shown to last over 10 years. The clock in the EX500/600 Series of MFDs is used to display the current time to the operator and to determine, among other things, the age of datalink products. Additionally, this clock is also used to tag logged data and in calculations such as ETA. Replacement of a CMOS battery is **optional**. The following section describes the steps that are needed to operate an EX500/600 Series MFD with a nonfunctioning CMOS battery

### 5.2 Operations without CMOS Battery

With Release 4.2 or later, displays with an inoperative CMOS Battery will automatically select "GPS" time once the GPS time becomes available.

When the system time selection is set to "Auto" or "GPS", the MFD will automatically correct the system time using the incoming GPS data once it is available. Until the GPS time is acquired by the connected GPS, the EX500/600 Series of MFDs will display an incorrect time. The connected GPS system typically takes 45 seconds or less to acquire GPS time following system startup. Since the GPS position (and thus time) is available prior to takeoff the time will always be correct prior to takeoff.

*AUX Page, Battery CAS Message*



### 5.3 CMOS Battery Replacement

For customers whose batteries are no longer operational, and are uncomfortable waiting for a GPS signal in order to facilitate the clock adjustment, we suggest replacement of the CMOS battery. Replacement of a CMOS battery is **optional**.

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