



**Panasonic**

# WEATHER IN THE CONNECTED COCKPIT

NBAA 2016

CONNECTING THE BUSINESS  
AND PLEASURE OF FLYING®

Panasonic Avionics Corporation

# PANASONIC CONNECTIVITY SYSTEMS

INTEGRATED SOLUTIONS

Providing two global solutions based on communications needs

**FLIGHT**LINK

Integrated for complete global coverage

**eXCONNECT**

Enabling a full suite of weather solutions for operators

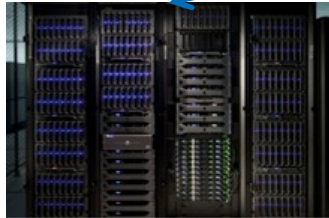
# Panasonic Weather Solutions

## Creation of a Better Weather Forecast

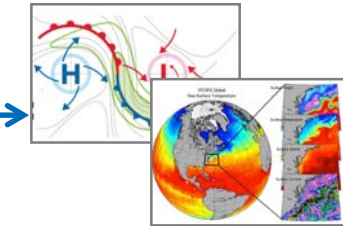
275+ PWS Sensor  
Equipped  
Commercial Aircraft



Iridium Global  
Data-Link Communication  
System



PWS Super  
Computers



4D Data Assimilation &  
High Resolution Weather  
Forecasting Models

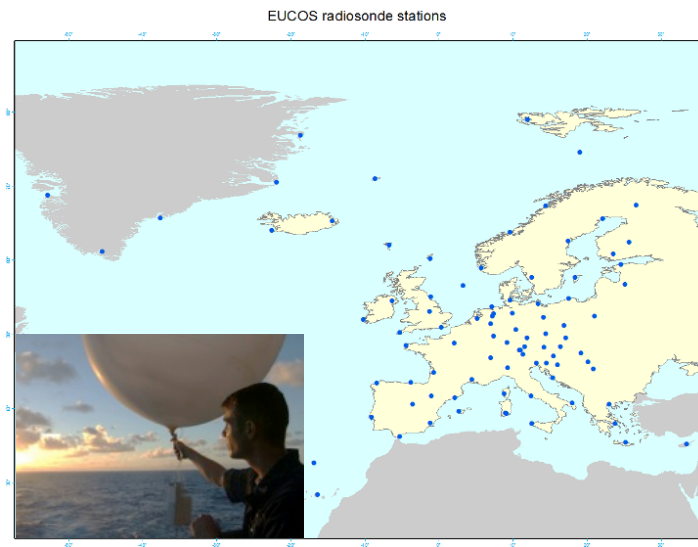


Custom Weather Products &  
Expert Meteorologists



# State-of-the-art Atmospheric Data Acquisition

## Weather Balloons



- 80+ yr. old weather balloon technology
- 91 locations in North America
- 2x daily soundings (12 hours apart)
- High latency reporting (2–4 hrs.)
- Inaccurate lat / lon position data

## PWS – TAMDAR (patented)



- **TAMDAR** atmospheric sensor
- 275+ aircraft in North America, Europe and Asia
- Continuous soundings
- Real time reporting (no latency)
- GPS-based date/time/position data
- ~2,500 soundings per day



**AIRMAP**  
**Panasonic**

1 6 conversations  
3 calls

-10K ft @ +2 hrs

UAL Off -5k ft

by search applied

29 of 276 aircraft  
3,043 of 75,178 observations

10 in view  
906 in view

+ UAL1003 N432UA  
KCLE KLAS

+ UAL1008 N547UA  
SKBO / BOG KIAH

19:55 Scheduled  
19:58 Actual

Scheduled 00:23  
Estimated 00:32

Out	Off	On	In
19:49	19:58	-	-

Call

2 min 12 sec 23:07

#280 24 old

Pressure Altitude 11720 ft  
GPS Altitude 11840 ft  
Air Temperature 0.00 °C  
Relative Humidity 0.00 %  
Wind 227 / 17.00 knots  
Ice Conditions No Ice  
Indicated Airspeed 305 knots (G)  
EDR median/peak 0.0 / 0.0  
Min. since peak EDR 0.0  
36° 12' 0" N, 78° 9' 6" W  
July 7, 2015 - 22:14:46

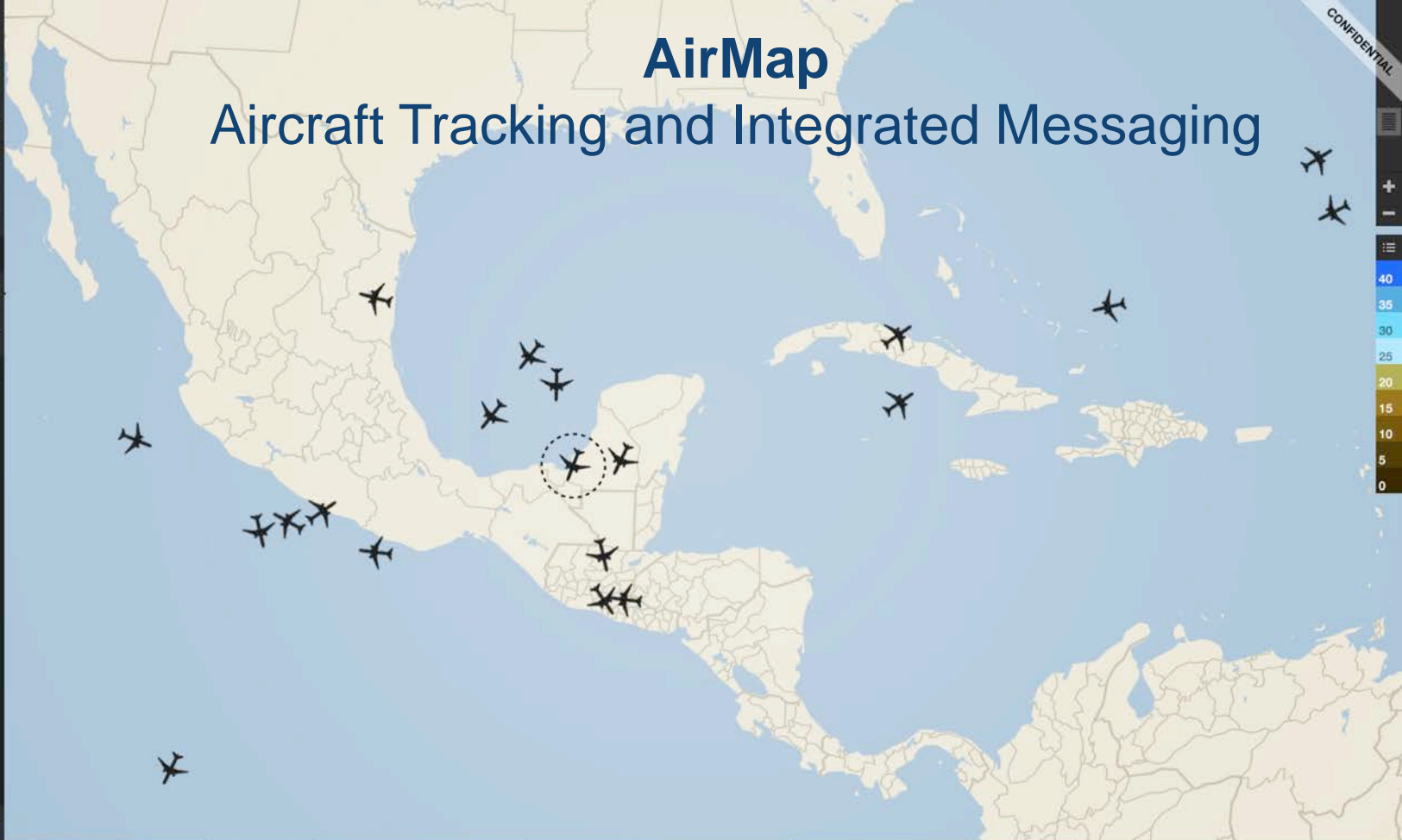
#279 401 old

#278 7:43 old

+ UAL101 N212UA  
EGCC / MAN KIAH

# AirMap

## Aircraft Tracking and Integrated Messaging



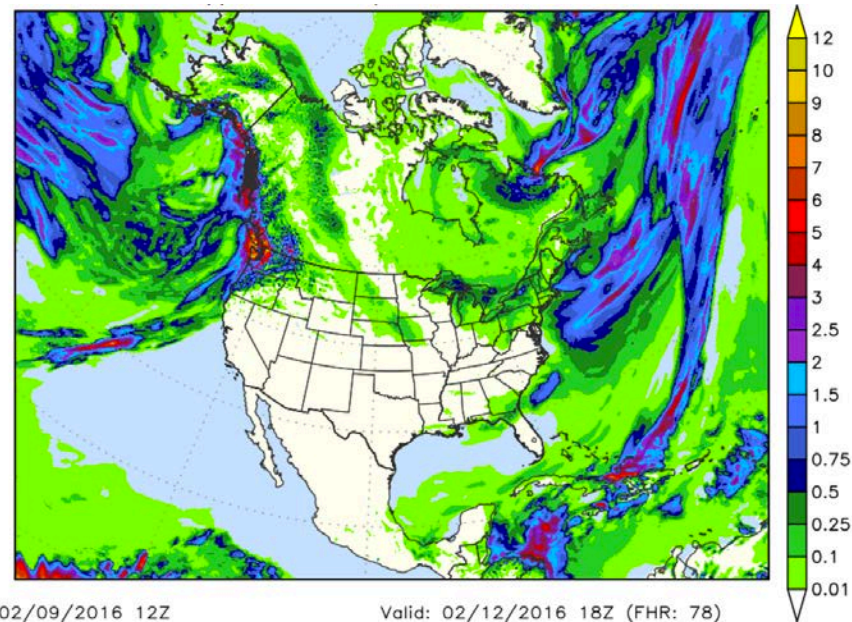
# Panasonic Weather Solutions

**Flight Optimization:** Advanced wind forecast data powering industry-leading flight optimization programs enabling lower fuel costs and reduced CO<sub>2</sub> emissions. These forecast winds are used for calculating optimized ascent and descent profiles, which are sent directly to the cockpit, and can also be used for enroute flight optimization.

**AirMap Weather:** Enhanced high-resolution aviation forecasts overlaid on a common user interface with Panasonic's satellite communications, voice, data, aircraft messaging and tracking solutions. AirMap is an ideal ground-based solution for operator awareness of the entire equipped fleet.

**4DAero:** Electronic Flight Bag (EFB) hazardous situational awareness and avoidance application, including flight plan overlay. 4DAero enables pilots to have increased situational awareness and efficiency.

**4D WeatherCast:** Panasonic's superior global weather forecasting technology is based on our patented TAMDAR weather sensing technology, unique data assimilation algorithms, weather modeling, and expert meteorological analysis, providing more accurate and higher resolution forecasts wherever aircraft operate.

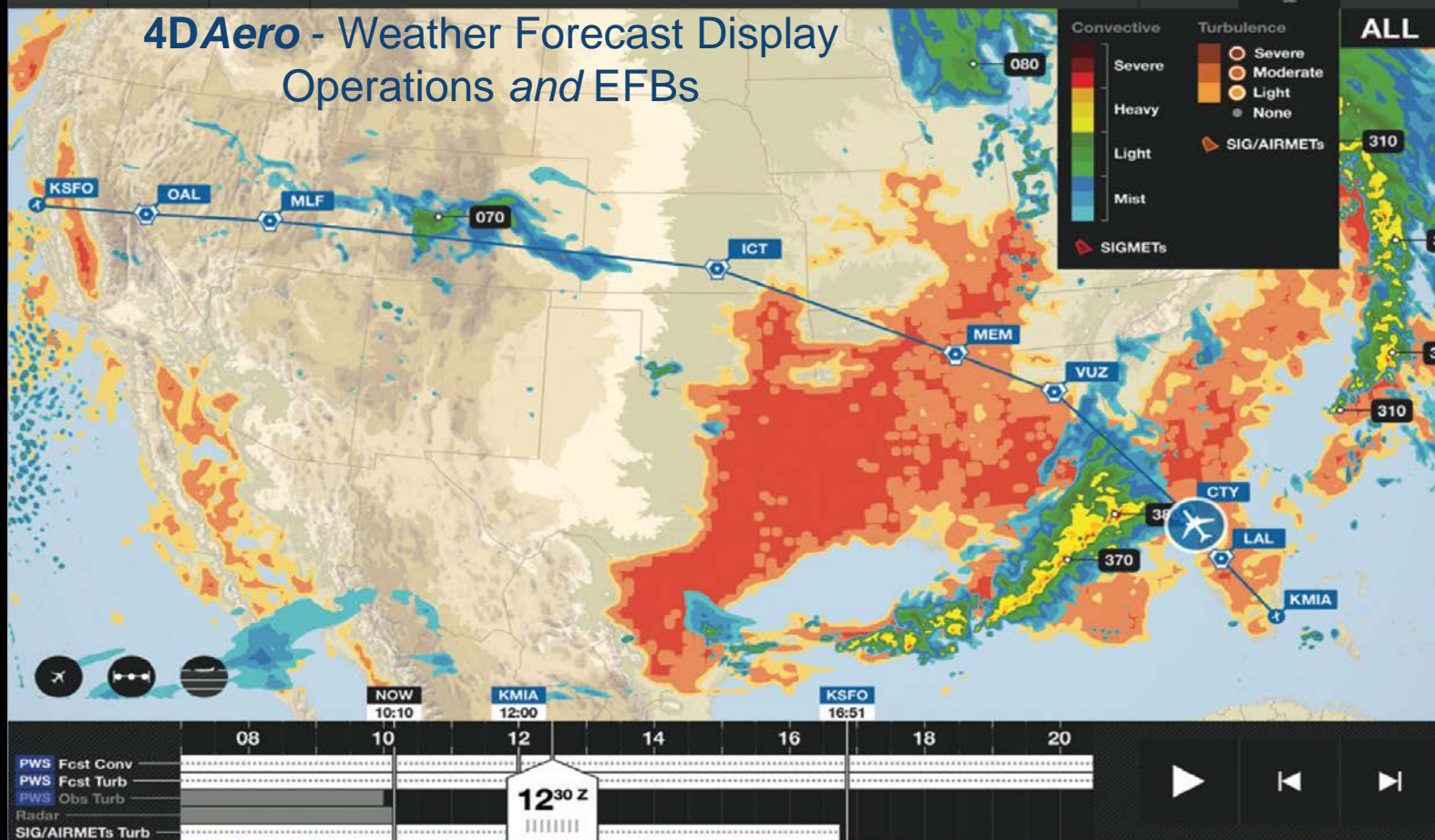




PWS Panasonic Weather Solutions



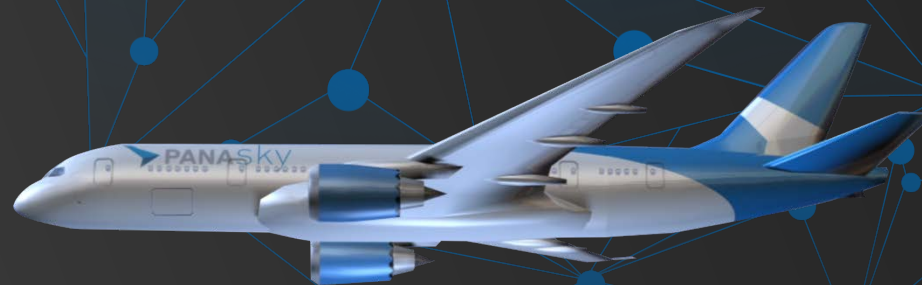
## 4DAero - Weather Forecast Display Operations and EFBs





**Panasonic**

Thank you



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# FLIGHTLINK

## 3 KEY ELEMENTS

FlightLink



Antenna



TAMDAR



### FLIGHTLINK COMMAND UNIT

- Satellite communications management
- ARINC standard installation
- Aircraft data processing & routing

### TAMDAR WEATHER SENSOR

- 4D raw weather data collection
- Worldwide operational sensor network

### MULTI-FUNCTION ANTENNA

- Single or dual Iridium poles
- Dedicated GPS

# Northeast “Blizzard?” (26-27 Jan 2015)

PWS forecast was more accurate than other models and

Table of average forecast snowfall total starting 48 hours in advance of storm

	ECMWF	NAM-12	NWS	PWS	Actual
PHL	13	8	10-15	3	1.2
LGA	21	21	20-25	8	11.0
EWR	21	18	20-25	6	6.5
BOS	23	22	25-30	28	24.6

**ECMWF**: European Center for Medium-Range Weather Forecasts, **NAM-12**: North American Mesoscale Forecast System, **NWS**: National Weather Service Forecast, **PWS**: Panasonic Weather Solutions Forecast Model

Before

National Weather Service

After

*“crippling and potentially historic blizzard” with 20 to 30 inches of snow, “locally higher amounts possible”*

*“We recognize the need to work harder and smarter to produce better forecasts and to **better communicate forecast uncertainty and manage expectations.**”*