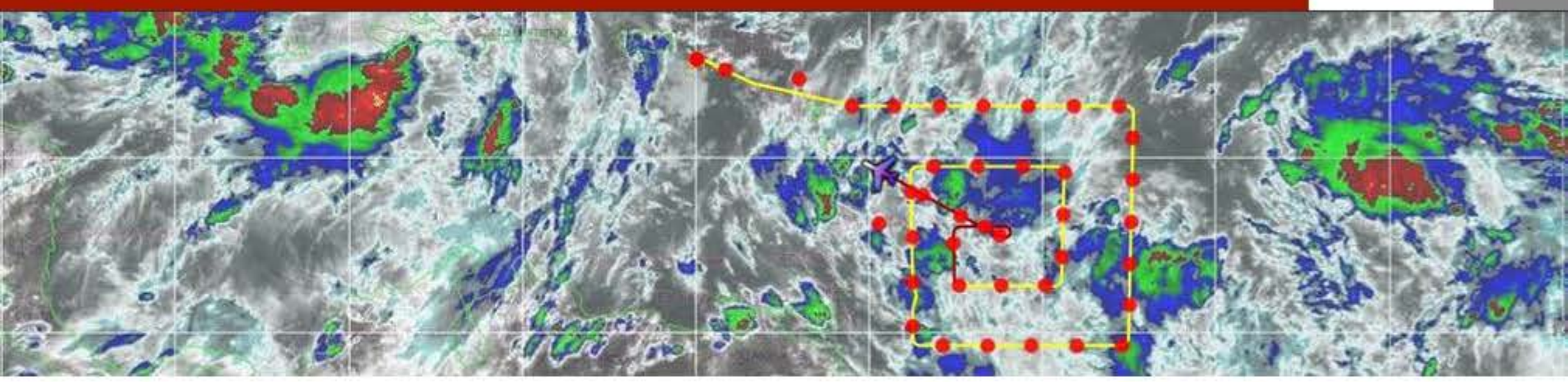

AVAPS Software

AVAPS Dropsonde System

AVAPS SOFTWARE - REAL-TIME DATA SYSTEM

The AVAPS system software is written in LabVIEW, a graphic programming language developed by National Instruments that permits multi-tasking in the Microsoft Windows operating system. Multitasking capability is critical for a multi-channel dropsonde data system. The system software performs several functions prior to release of a dropsonde. The software logs the current system configuration and flight mission information, and initializes all electronic hardware for the release. A graphical spectral analysis of the 400-406 MHz meteorological RF band is provided so that the operator can select a transmitter frequency free of interfering signals. The system then performs a functional test of the sonde's PTH sensors and the 400 MHz transmitter by displaying cabin PTH measurements from the sonde transmitted through the 400 MHz telemetry link. When configured, the PC also communicates with the aircraft's sonde launch system, via the Dropsonde Telemetry Chassis, to launch a sonde at the operator's command. If the host aircraft has a data system to provide flight-level meteorological data (pressure, air temperature, dew point, wind speed, wind direction, altitude, etc.), these are automatically received by the AVAPS PC. However, the AVAPS does not require an interface with a flight-level data system in order to function.

After launch, the software processes PTH and GPS data from up to eight dropsondes via the Dropsonde Telemetry Chassis. PTH data is available every 0.5 seconds and wind data is available every 0.25 seconds. The AVAPS system PC displays in real-time the PTH and wind data both in text and graphically, also displayed is the number of GPS satellites being tracked by the dropsonde, and geopotential altitude (computed hydrostatically from the PTH data). These and other parameters are also stored on the PC hard drive for archiving, and can be directed to other computers on the aircraft for further processing and transmission off the aircraft.

ASPEN SOFTWARE - POST PROCESSING

After a sounding is complete, the data can be analyzed and modified using a separate program, ASPEN (Atmospheric Sounding Processing Environment). The application functions identically in the Linux, Apple OSX, and MS Windows environments.

ASPEN capabilities:

- Automatically apply quality control procedures to the sounding data
- Present data in tabular and graphical forms
- Automatically determine levels and code them in WMO and BUFR message formats
- Transmit the WMO messages to other systems
- Save the raw and derived data products in various formats

Since Aspen can process data provided in the AVAPS "D" file, NCAR GAUS formats, it is able to analyze both dropsonde and upsonde soundings. Aspen is designed to operate as automatically as possible, while allowing the user to have some control over the Quality Control (QC) methods. For instance, as soon as the user selects a sounding file for processing, the data is brought into Aspen and automatically analyzed. In most cases this first pass will be the only one required. If the processing needs to be modified, the user can change the QC parameters and reprocess the data as many times as necessary. An extensive series of QC algorithms are applied to the data. These algorithms typically have one or two parameters that may be adjusted by the user if the default values are not suitable for a particular sounding. The user can save the modified options, so that when a new sounding is opened, the initial analysis will use the customized QC parameters. Aspen can have up to six sounding files open at the same time. This makes it convenient to compare soundings.

For more information about ASPEN software, go to this link.

AVAPS

AVAPS Aircraft Data System
AVAPS Data Workflow
AVAPS Dropsondes
AVAPS History
AVAPS Launchers
AVAPS Software
Contact Information
Documentation
EOL Sounding File Format
Gallery
Papers using AVAPS Data

DEPLOYMENTS

PREDICT
T-PARC
HS3 2011
HS3 2012
HS3 2013
CONCORDIASI