

Current Status of AMS Software

Update on AMS Software Status

- Summary of AMS software developments since 2nd AMS User's Meeting

v.3.6.6 and v.3.6.9b  **Current Version:
V3.9.8 !!!**

- Description of plans for future software upgrades

Discussion of problems

Suggestions for improvements for the software.

Modifications of Parameter Menu

Goal:

- Simplify Parameter menu by separating Menu Parameters that need to be changed often from those that are not changed often.

DEFAULT MENU contains:

- Critical “Factory Settings” that mostly need to be set properly only once, and then do not need to be changed often.
- Buttons for accessing modes of operation that are not the normal mode of operation,
- Parameters to enable troubleshooting of software

Modifications of Parameter Menu

PARAMETER MENU contains:

- Parameters that need to be changed more often to operate the AMS (ex. Averaging and Saving,).

NOTE:

- AMS Software versions 3.8.3 and up use Parameter Menu Version 3 (225 total parameters). These software versions will automatically convert the Parameter Menu Version 2 to Menu Version 3. HOWEVER, OLD VERSIONS CANNOT DO THE REVERSE!!!!
- When updating to newer versions of the software always make a backup of the old menu versions- Also, in the logfiles directory, you can find menu.prm files saved according to date.

Mass Spec Window Display

Goals:

- Provide tools to help interpret the complex mass spectrum in real time.
- Work towards similar if not identical MS displays in both James Allan's analysis program and the AMS Software.
- Coloring of MS peaks according to Species (Sulfate, Nitrate, Water, Ammonium, Organic)
- Calculation of nitrate equivalent mass loadings of the various species - this still needs to be refined to account for all interferences. *Try to integrate reading of batch files used in James' program into the AMS program.*

Calibrations

Goal:

- Simplify/Clarify Calibration Procedures
- Nitrate Ionization Efficiency Calibration
 - Calculate IPP based on Region 2 only
 - Enable calculation of IPP for individual fragments as well as species.
- Quadrupole Mass/Resolution Calibration
 - Automated user friendly procedure
 - Stick intensity calibration done automatically around m/z 28 each time program saves.

AMS Operating Modes

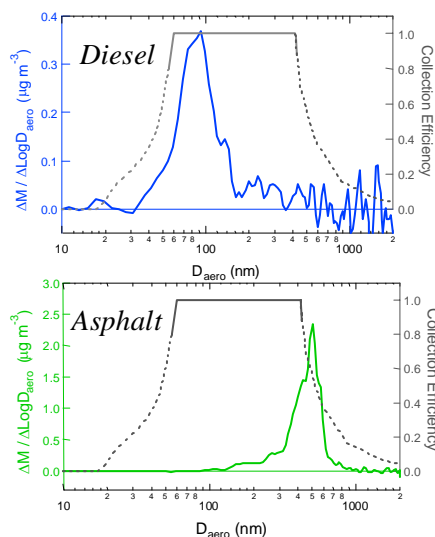
Goal:

Used to acquire AMS field data in a non-standard way

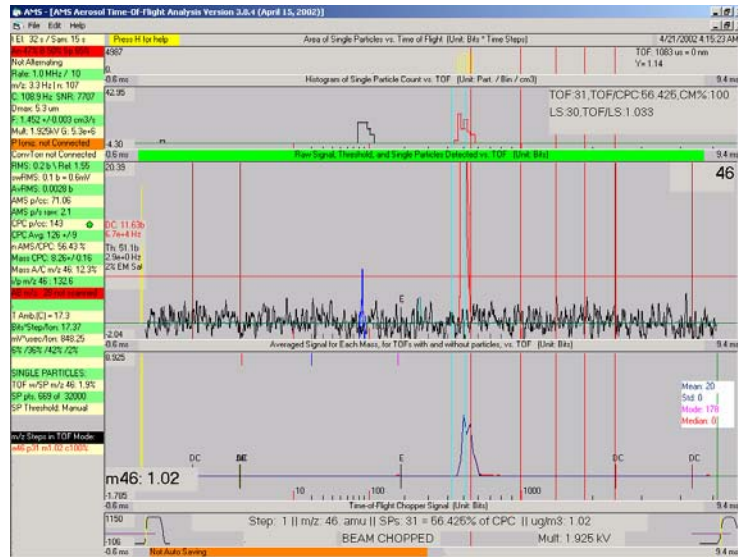
- **Eddy Correlation Mode:** Synchronize averaging of TOF data w/ acquisition of 10 Hz anemometer data. This currently works only for 1 TOF mass.
- **Airplane Mode:** Automates setting of menu parameters for airplane operation- Used during CalTech Twin-Otter measurement campaign.
- **NYC Alternate Mode:** Used to acquire 2 S MS/TOF data during mobile measurements. Limits time lost due to repeated stopping and starting of DAQ between TOF/MS.

Rapid Realtime Aerosol Size Distributions

4 sec data rate



Light Scattering Mode



Doug: "By George, we've got it!"

Saving of Data

Heirarchical Data Format (HDF):

- Data saved in binary format/ file
- Data divided into 5 gps (TOF,MS,Run,Mode,SP) and saved each group with different frequency
- Data saved as matrices, can extract whatever data you want without having to read in sequence.
- Implemented partially for Eddy Correlation Mode

➡ *Will be important as #Files Saved Increases*

Save Control Via Digital Signals:

- Saves on every change of digital state of specified line. Data averaged after specified delay.

Future Updates

- Continue to try and simplify displays/labels so that user can easily find important information/operating parameters.
- Computer-controlled ramping of Oven temperature
- Jump-MS Mode
- Move to saving files in HDF format?
- Setting Menu Parameters via files/ Macro language
- Integrated Mode to allow for switching between the various operating methods.

Questions

How do we deal with the software as user base grows?

- Open Source Code
 - Over 1000 pages of code when printed- Would be hard to support changes!*
- Separate Programs that interact w/ AMS Software
 - Temperature controlled inlet, switching between valves*
 - in prophet, Movable Wire*
- Specialized Modules that are integrated into software.
 - NYC Alternate Mode, Eddy Correlation*