PREPARING FOR BALLOON FLIGHT WITH USB-MSP AND RM-60

AW-RADW SOFTWARE INSTALLATION

Run setup program on CD:
aware_setup_msp.exe
and follow the on-screen prompts.

SETTING AW-RADW SOFTWARE DEFAULTS

After Aw-Radw installation is complete, to set Aw-Radw's default format to CPM (Counts Per Minute) or CP10Sec (Counts Per 10 Seconds), start Aw-Radw by clicking on Desktop Aw-Radw icon that the aware_setup_msp.exe setup program created.

Choose the following Aw-Radw menu items:
'Rad Options' - 'RM Calibration Factor' and enter 100 then click OK.
(For CP10Sec enter 0)

Next program asks 'Enter Y-Axis Caption' and enter CPM then click OK.
(For CP10Sec enter CP10Sec)

To set Aw-Radw's default time base unit (TBU) to sixty seconds:
'Rad Options' – 'TBU (Time Base Unit)' and enter 60 then click OK.
(For CP10Sec enter 10)

Now exit program 'Exit' and Aw-Radw will store the new defaults.

TEST AW-RADW – USB-MSP – RM-60 (with or without USB-MSP batteries installed)

If the Windows program Aw-Radw is running exit it by clicking 'Exit'.

Plug RM-60 into USB-MSP using provided four conductor reversing telephone cable.

Plug USB-MSP into the PC's USB port using provide USB cable.

Several times a minute, with each radiation detection, the USB-MSP's blue LED should flash.

Start Aw-Radw by clicking on Desktop Aw-Radw icon that the aware_setup_msp.exe setup program created. Aw-Radw should automatically find the USB virtual COM port the USB-MSP is plugged into and set it as default.

Choose the following Aw-Radw menu items:
'Rad Collection'
'Express Start Collection of Rad Data'

The program prompts for the 'Aware Binary Rad Data File'. Click 'Save' to accept the file name the program creates as default from system date-time or enter another file name.

Next the program prompts 'Enter Message for Rad File'. Just click 'OK' to accept the default message 'No Message' or enter something like Test.

Next the program prompts for an 'ASCII output file'. Hit 'Cancel' or press the Esc key to skip the creation of the ASCII file.

Next the program will begin collecting radiation data. Note that when starting rad collection with either the 'Start Collection of Rad Data' or 'Express Start Collection of Rad Data', when the program prompts for various items hit 'Cancel' to skip the item. Hit 'Stop' to quit the launching of the radiation collection session.

After the first row of data displays choose:
'Graphs'
'Open Aw-Graph's Bitmap Graph'
to view the real-time graph of radiation data. First a dialog opens asking "Enter # of Points Averaged per Point Displayed". Enter 1 or 2 or some other number then click OK. Next a dialog opens asking "Enter Max # of Points to Load (0=All)". Enter a number or accept default and click OK. Next a child window opens and after a few seconds (depending on how fast your PC is) the real-time graph appears. See Aw-Radw's help file under "Open Aw-Graph's Bitmap Graph" for additional information about Aw-Graph.

(Note: For use with 64bit Windows, click to check 'Use DOSBox to Launch Aw-Graph and Aw-Fast' before clicking 'Open Aw-Graph's Bitmap Graph').

To stop collection, click 'Rad Collection' 'Stop Collection'.

The above is how one would use the RM-60 and USB-MSP in the laboratory for real-time data collection and display.

TO PREPARE USB-MSP FOR FLIGHT

Choose the following Aw-Radw menu items:

'Rad Options' – 'Micro-Controller Options' – 'Alarm's Action Settings'
then click to un-check 'Alarm LED'
then click 'Send Above Settings to Micro-Controller'

The above tells USB-MSP to not activate its Alarm LED. This will save battery power during the flight.

Next choose the following Aw-Radw menu items:

'Rad Options' – 'Micro-Controller Options' – 'Set Storing TBU'
and enter 60 for sixty seconds. (For CP10Sec enter 10)

The above sets USB-MSP's default count storing interval to 60 seconds, i.e. Counts per Minute (CPM). (10 seconds for CP10Sec)

The USB-MSP stores all parameters including the above, in its flash memory so even if all power is removed, the parameters will be retained (as-well-as any stored radiation data).

ON DAY OF FLIGHT

It is assumed you have set Aw-Radw software defaults as per the above instructions "*SETTING AW-RADW SOFTWARE DEFAULTS"*

Very important, make sure the laptop PC's clock is set to the correct date-time.

Make sure you have Aware's telephone number (800-729-5397) and a cell phone, just in case you have a problem.

Install fresh USB-MSP AAA batteries. The batteries should last a very long time. The most powerful and by far the lightest batteries and capable of very low temperatures, are Energizer® Ultimate Lithium Batteries http://www.energizer.com/batteries/energizer-ultimate-lithium-batteries Check Amazon for "Energizer Ultimate Lithium AAA Batteries"

Make sure the batteries are well connected and secure perhaps with Velcro strap. If power is lost even for a brief period, the USB-MSP will stop storing data.

Plug RM-60 into USB-MSP and USB-MSP into laptop's USB port.

Start Aw-Radw by clicking on Desktop Aw-Radw icon that the aware_setup_msp.exe setup program created.

Choose the following Aw-Radw menu items:

'Rad Options' – 'Micro-Controller Options' – 'Erase Store Memory'
to make sure the USB-MSP's memory is free of past data.

Next choose the following Aw-Radw menu items:
'Rad Options' – 'Micro-Controller Options' – 'Start Store Command'

Aw-Radw pop-up box says "Enter TBU (Time Base Unit) in Seconds' make sure it defaults to 60. If not, enter 60. (For CP10Sec enter 10)

Once Aw-Radw says "Sent Start Store Command" the USB-MSP is storing the data and ready for the flight. Note that when Aw-Radw sends the Start Store Command it also syncs the USB-MSP date-time with the PC's date-time.

To check all is OK, choose the following Aw-Radw menu items: 'Rad Options' – 'Micro-Controller Options'- 'Get Micro-Controller Information' and the program queries the USB-MSP for information and prints it to Aw-Radw's main window. Make sure that the line "Storing" is present and also "Store Secs: 60" is present. (For CP10Sec "Store Secs: 10")

Unplug the USB cable from the USB-MSP. Once unplugged make sure the batteries never lose contact with the terminals. For example, if you drop the unit and are not sure if the batteries momentarily lost connection, plug the USB-MSP into the PC and carry out the above instructions again.

Make sure the USB-MSP blue LED is flashing a few times per minute. Place USB-MSP-RM-60 in balloon and launch. Note the exact time of the launch.

AFTER FLIGHT RETRIEVAL OF DATA

Retrieve USB-MSP – RM-60. The stored data will remain in the USB-MSP's flash memory even with no power.

To stop data storage, remove the batteries and make note of the time which you can use later as a verification of the stored data's last time code.

If you leave the batteries in-place, the USB-MSP will continue to store new data.

Plug USB-MSP into laptop's USB port using the provided cable (with or without the batteries).

Start Aw-Radw by clicking on Desktop Aw-Radw icon that the aware_setup_msp.exe setup program created.

Choose the following Aw-Radw menu items:

'Rad Options' – 'Micro-Controller Options' – 'Download Stored Data'
Program asks 'Enter Detector Dead Time in Microseconds' and click 'OK' to accept the default or enter 0.

Program asks 'Select Aware Binary Rad File' and either accept the default filename or enter a filename such as "Balloon_Flight1.Rad". Click 'Save'.

Next program asks 'Enter Message For Rad File' and enter something like BALLOON FLIGHT 1

Next program asks 'Select ASCII Output File' and enter a filename such as "Balloon_Flight1.TXT". Click 'Save'.

Next program downloads the stored data and then prints to its main window 'Download Passed CRC Check'

Note if you did not unplug the batteries, the USB-MSP is still storing data. To stop store, either unplug the USB cable and batteries or choose the following Aw-Radw menu items: 'Rad Options' – 'Micro-Controller Options' – 'Stop Store Command'

Note one can download the same data any number of times. The only way to empty the USB-MSP flash memory storage is to click the Aw-Radw menu items: 'Rad Options' – 'Micro-Controller Options' – 'Erase Store Memory' or by sending it the appropriate text commands.

Use windows explorer of your spreadsheet program to find your Balloon_Flight1.TXT file. Load this into a spreadsheet. The default format for the ASCII output file is two columns separated by TAB i.e. Excel-Time-Code TAB CPM. Use the spreadsheet program to format the Excel-Time-Code column as date-time.

The format of the ASCII text file can be set using Aw-Radw menu items 'Output Options' – 'ASCII Text File and Print Options'.

To learn more about these ASCII options, open Aw-Radw's help file 'Help' – 'Aw-Radw Help File' and search for "ASCII Text File and Print Options" (Edit – Find - *ASCII Text File and Print Options*).

One can also generate an ASCII file from the 'Aware Binary Rad File' (mentioned above as Balloon_Flight1.Rad). To do so, choose the following Aw-Radw menu items: 'Output Options' – 'Convert Rad Binary file to ASCII' and follow the prompts.

One can view the data in the 'Aware Binary Rad File' (mentioned above as Balloon_Flight1.Rad). To do so, choose the following Aw-Radw menu items: 'Graphs' – Open Aw-Radw's Bitmap Graph' then browse for the binary file Balloon_Flight1.Rad.

Before the actual flight, one should practice the above ON DAY OF FLIGHT instructions, wait a few minutes or hours to simulate the flight, and then practice the above AFTER FLIGHT RETRIEVAL OF DATA instructions.

The most common mistake is forgetting to 'Rad Options' – 'Micro-Controller Options' – 'Erase Store Memory' to make sure the USB-MSP's memory is free of past radiation data files before starting collection and the flight in-which-case USB-MSP might not have enough memory available to store all the new radiation data.

Notes: The USB-MSP data storage size is 22,527 bytes. Each byte can hold up to 127 counts. If the count per TBU (Time Base Unit) is larger than 127 counts, then 2 bytes of storage will be used. If the count per TBU is greater than 16,383 counts, then 3 bytes of storage will be used, etc.

Past flights indicate at 100,000 feet, the RM-60 will count ~900 CPM or 150 CP10Sec. At such a count rate, with a CPM setting, the storage size should allow at least 11,263 minutes of continues data, or 187 hours or 7.8 days.

With a CP10Sec setting, the storage size should allow at least 1,877 minutes of continues data, or 31 hours or 1.3 days. The actual storage time will be longer due to the fact that some of the CP10Sec will be less than 127 which use only one byte of storage.

Questions no matter how small: Bryan at (800-729-5397) or (302-655-3800) or email boardmanb@aw-el.com

Best Regards / Bryan Boardman / Manager / Aware Electronics Corp

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