Guide for Launching Radiosondes

Sounding system will have been checked out prior to cruise confirming that everything is working

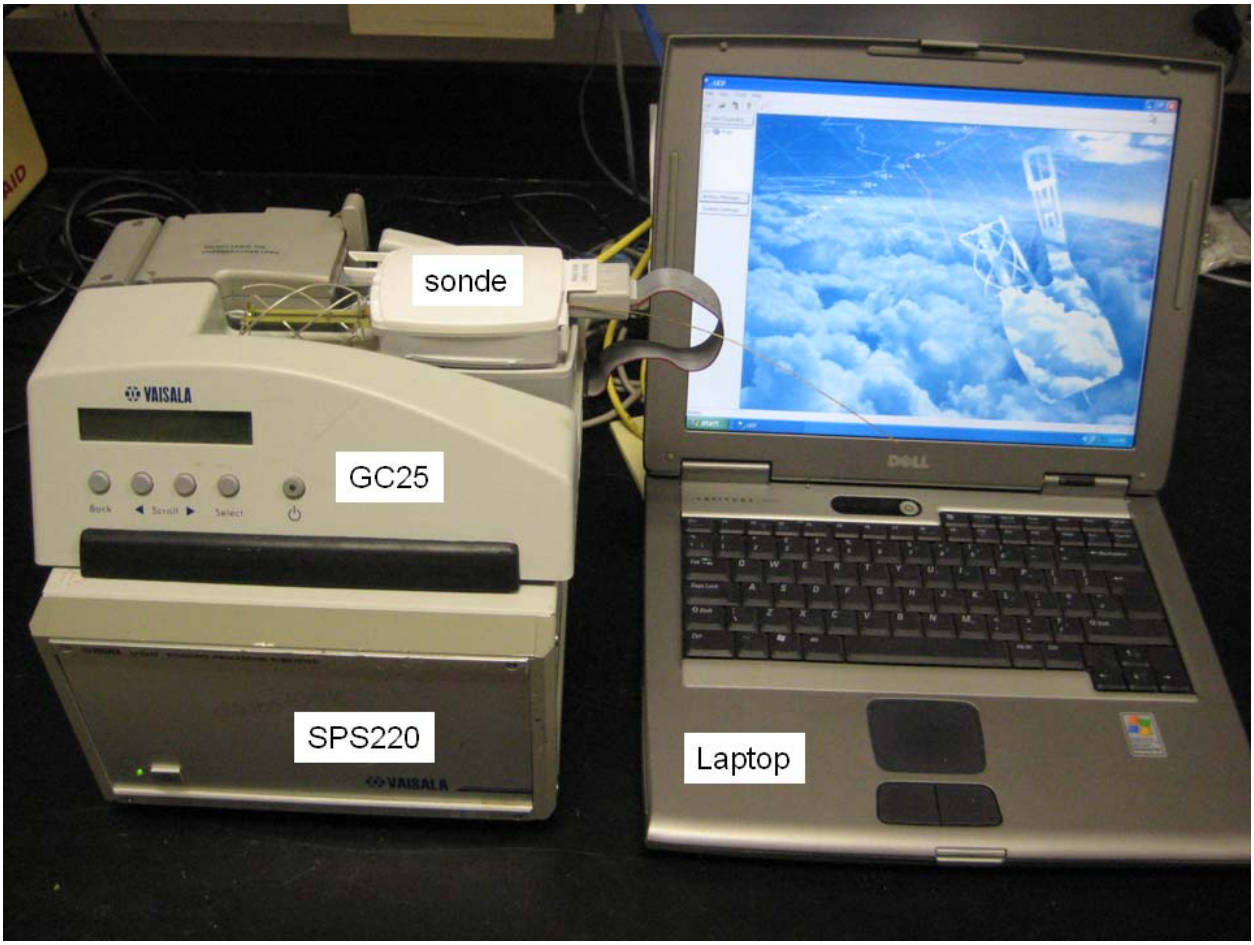


Figure 1 MW31 Balloon Sounding System

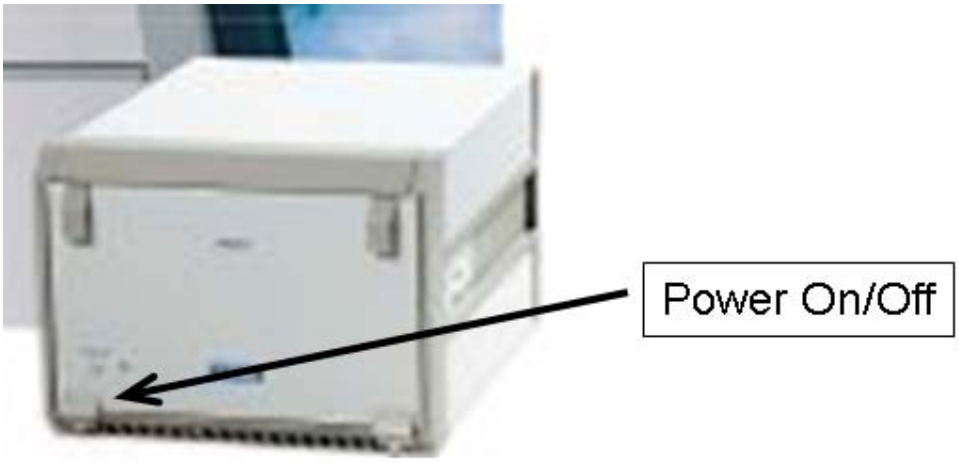
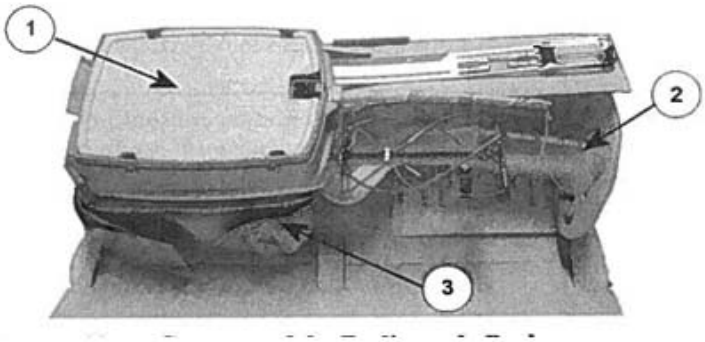


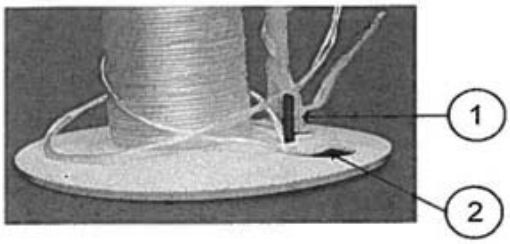
Figure 2 SPS220

Red hi-lite indicates key steps: activating battery … filling balloon



1 = Radiosonde
2 = Unwinder
3 = Battery

3. Remove the radiosonde from the package, free the antenna, and take the unwinder out of the package.
4. Remove the small plastic rubber wire coil from the unwinder.



1 = Rubber wire coil
2 = Unwinder lip

5. Make sure the plastic lip, under which the string runs, is level with the unwinder bottom plate. If the lip is bent, bend it gently back to level the position.

Figure 3 RS92 sonde with battery and un-winder

UnPack RS92 sonde Figure 3
Don't open battery yet.

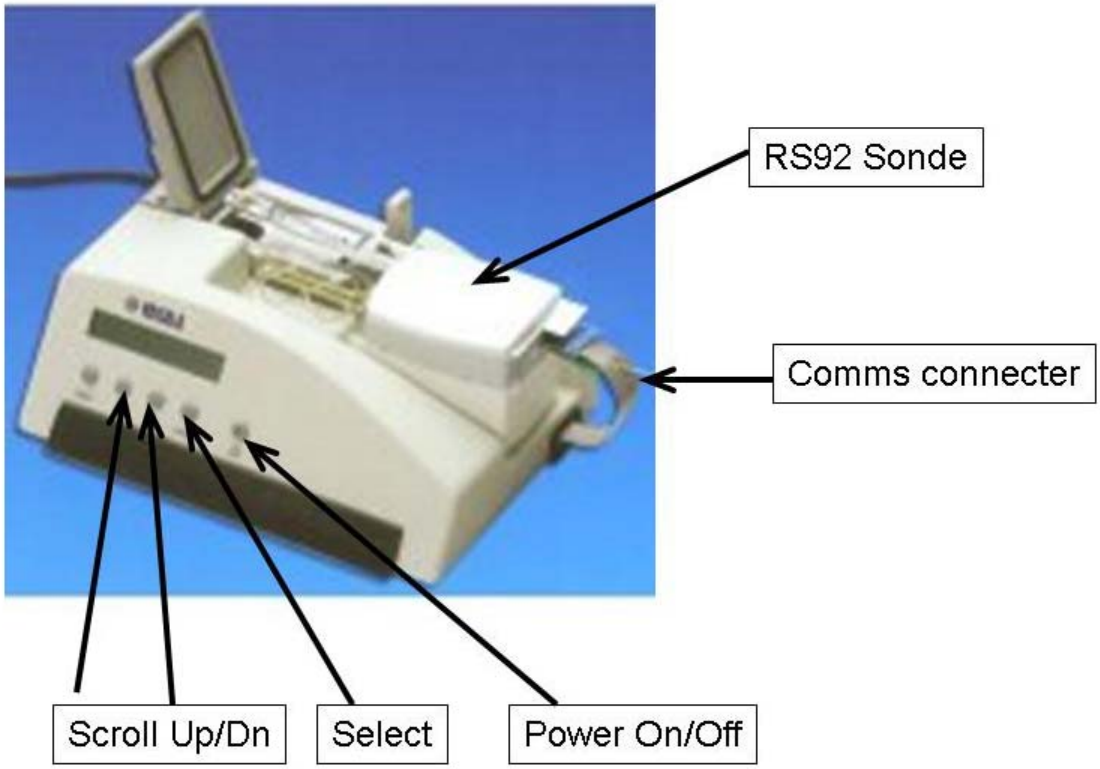


Figure 4 GC25 ground check station

Power up the SPS220 Fig 2
Power up Laptop
Login as administrator (no password required)
Wait for LAN connection to SPS220 (icon by clock…takes a minute or 2)

Start DigicoraIII software (ICON)
Maximize window that comes up

Carefully connect sonde to ground check station (GC25) Fig 4
Don't touch T/RH sensor
Power up ground check station
LCD screen on GC25 should say:
Identifying…RS92 Detected…Recond. U-sensor?
Don't touch front panel buttons!!
Close lid carefully!!

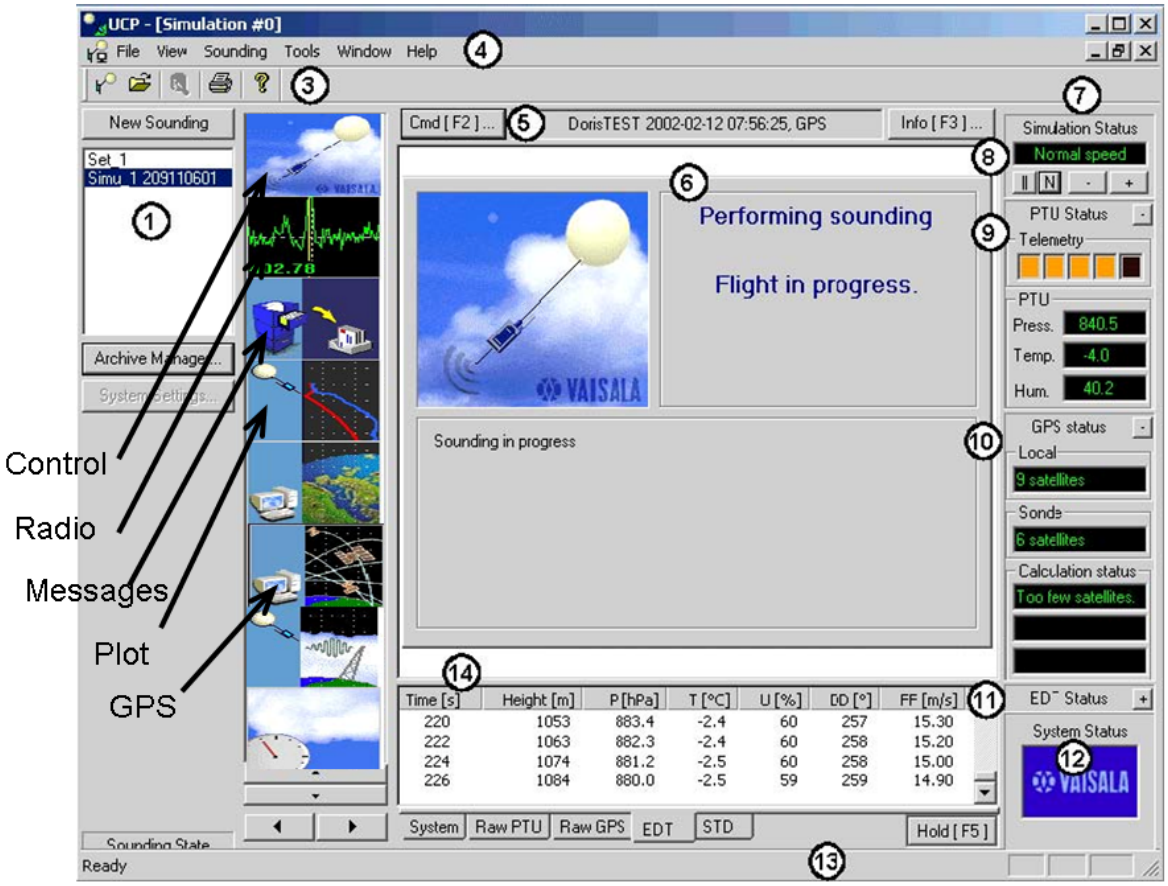


Figure 5 Main DigiCORA-III sounding window

Blue hi-lite indicates Messages displayed by DigiCORA-III software (Fig 5-"6")

<u>Prior to first sounding only</u> you should setup Station Position and name information
Click Tools, then choose Station Position (on top menu line)
Wait for window asking for Lat/Lon/Alt

Start Sounding System
Requesting station Position
Enter Lat/Lon/Launch elevation (MSL m)
Under WMO Station enter
Enter 3 letter name (HMT, BAO…) Used as part of file names
You only need to enter the block/number and WMO region if you intend to use the WMO messages produced by the software

Click Next

Start Sounding System
Requesting station Position
Check station is moving if launching from a ship, not checked for fixed sites

Click Finish

Click New Sounding (Fig 5 "1")

Selecting Sonde
Coefficients via cable
Wait for message " Reading coefficient information. Z510142 read successfully".
These are read via serial cable between GC25 and Laptop

Click Next

Selecting Sonde
Radiosonde Properties
Only one Wind Type choice for RS92 digital sondes "GPS-DCC"
If doing OZONE, click on SPECIAL drop down menu and choose OIF92
If you need or want to change frequency ***Click Set***, ***Change*** *and then* ***Click Next***

Click Next

Initializing Sounding System
Triggering Profiles
Don't change anything

Click Next

Initializing Sounding System
Research Mode Option Selection
Don't click on either REASEARH box unless having problems with down drafts (see manual)

Click Next

Initializing Sounding System
Station Sounding Position Information Required
Wait for GPS coordinates on left side verifying local GPS antenna is receiving.

Click on >>

Moves current position into right box (important for SHIP..moving stations)

Click Next

Initializing Sounding System
Select Sounding Start Mode
Uncheck "Manual" and Check "Automatic"

Click Next

Initializing Sounding System
Sonde Reconditioning

Click Recond

Click Recond (again)

Initializing Sounding System
Sonde connection
3 min timer will start counting down
Sonde reconditioning done. Waiting for sonde to stabilize.
Next a 2 min timer will start

********** **For water activated battery ONLY**

Now is the time to activate the battery during this 5 min down if it is.

Open battery package

Don't take battery out of white-plastic case
Use package to hold water (Fig 6)
Adjust connector so it won't be submerged
Fill package with water just above top of battery

May have to add more a few seconds later as battery absorbs water.
Let battery sit in water for 5 minutes, then dump water, “do not drink”.

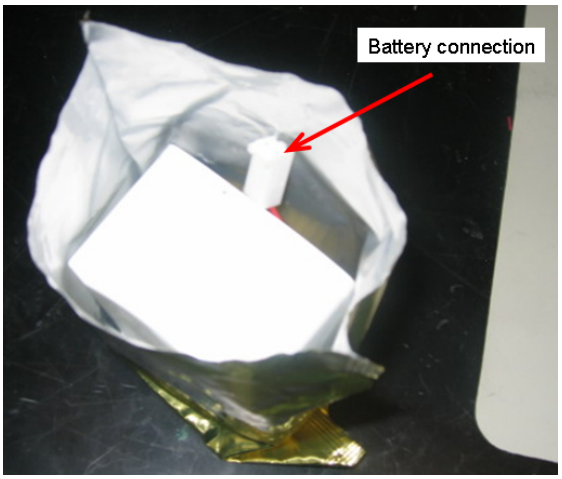


Figure 6 RS92 battery in pouch ready for activating with water

On LAPTOP screen:

Initializing Sounding System
Sonde connection

Click Next

Initializing Sounding System
SGC Request
Don’t check Perform GC box
Watch PTU data cycle(Fig 5-“13”) Raw PTU

Click Next

Check the number of Local GPS satellites
6-10 should come up quickly (Fig 5-“10”)
Performing Sounding
Monitoring Sonde

****

Take battery out of water or package if Lithium battery

Shake gently to remove excess water

Make sure PTU data are cycling in sounding window and they are good values. If RH is >2% change dessicant. Wait for RH to readjust. Dessicant can be bad. Change sonce only if sure RH sensor is bad.

Disconnect and Remove sonde from ground check station

Laptop will **BEEP** indicating no signal when switching to battery

Connect battery to radiosonde

Match the plug configuration (Polarity!!!) (Fig 6)

Attach battery in plastic case to sonde body

Make sure you hear it click and it is secure!!

Check sonde is retransmitting data and signal strength is good (Fig 5-“9-10”)

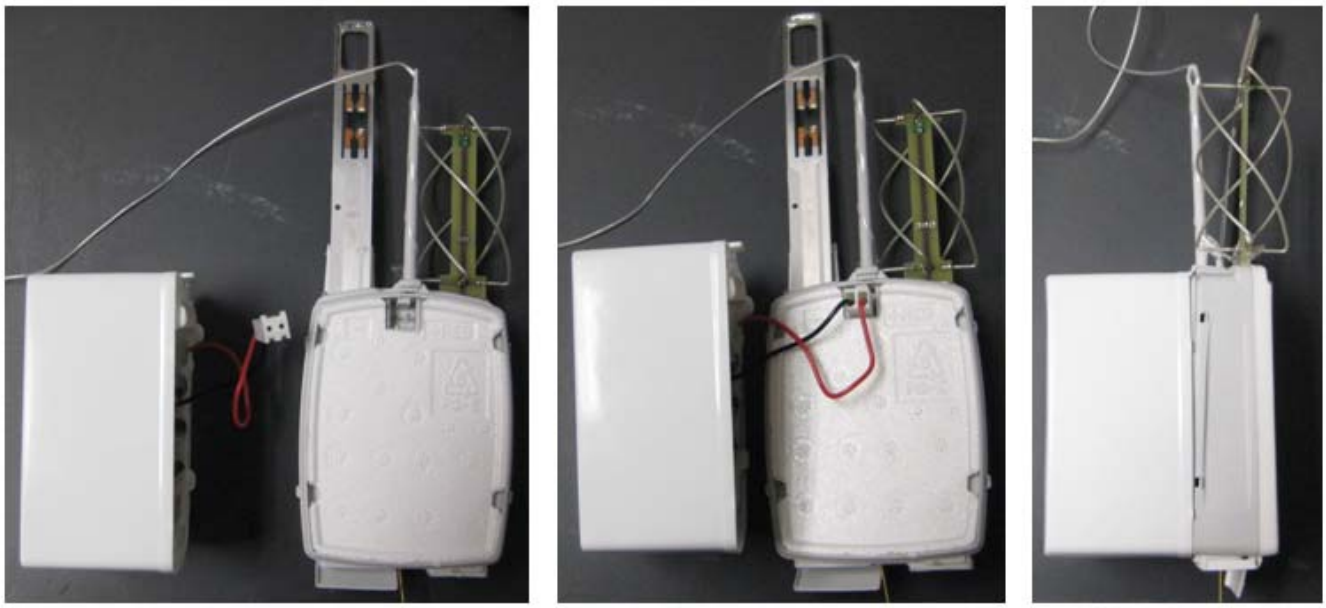


Figure 7 Attaching Battery to sonde

****

Take radiosonde outside

Place sonde so that it has a clear view of the sky, but not in direct sun if possible

Keep GPS helix antenna vertical

Make sure sonde won’t fall if ship has a sudden pitch or roll

Return to Laptop and check to see how many SONDE satellites are visible (Fig 4-“10”)

Until 4 or more show it will be RED indicating not enough to calculate winds

Click on Surface Obs

Enter surface obs

Performing Sounding

Give the Surface Observation Values Now

Make sure to enter the correct units (m/s, C, mb, %)

Get obs from ship’s system if not available sonde data once acclimated outside

Compare sonde readings to SHIP for accuracy

Click Next

Record surface obs on log sheet

Performing Sounding

Give the Additional Surface Observation Values Now

No cloud information entered

Click Next

Performing Sounding

Release sonde

Call bridge and inform them you will be releasing in 5-10 mins

Make arrangements with FOO and Chief Scientist how ship will operate during launches. In strong winds you may want to ask the ship to position the wind off the Port or Starboard quarter for easier release.

****

Go to Staging Bay

Inflate balloon

Inflate with 400-450 psi (shooting for an ascent rate of 5 m/s).

Place Sensor boom into Launch Position Fig 7

Attach balloon to sonde unwinder Fig 9

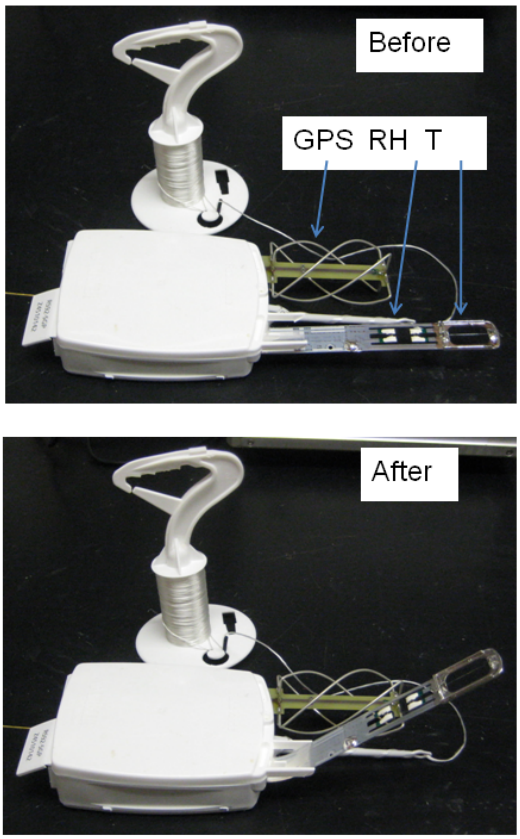


Figure 7 Sensor Arm Before and After locoking into position for launch

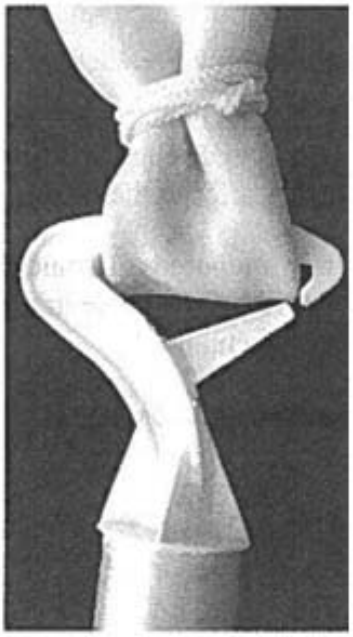


Figure 9 Balloon connected to unwinder (use tie wrap)

Walk sonde to open area on deck

Make sure little black rubber piece is removed from un-winder

Make sure string on un-winder is free

Have partner check for 4 local satellites or hold sonde high for a min or two to regain GPS lock

Release when ready being careful not to throw sonde or hang on too long…be gentle.

Take weather obs (clouds, seas, precip, etc)

Finish filling in log sheet

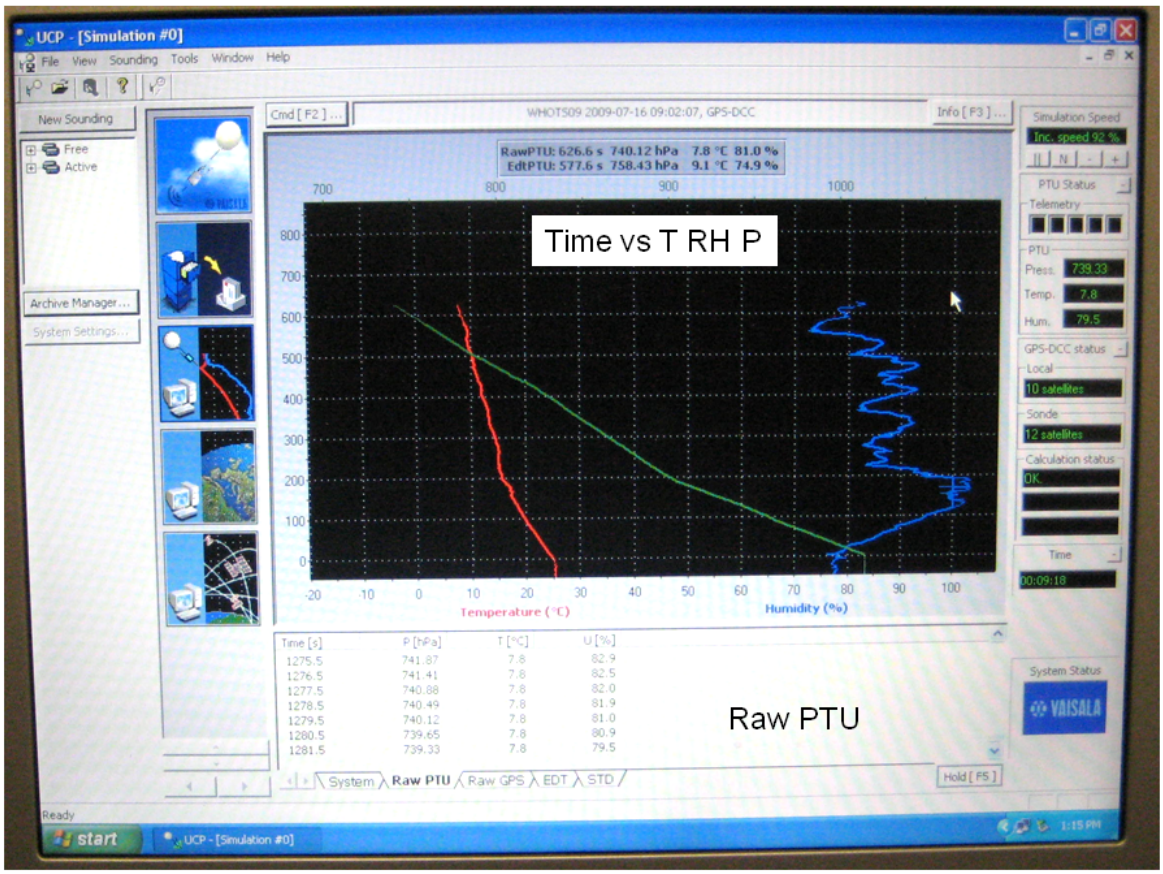


Figure 10 Example of laptop display during flight

Balloon flights take between 1-1/2 to 2 hours and should reach over 50mb and 20km pretty easily. If not, make sure you aren't putting too much helium in the balloon.

While sonde is in the air there is no need to adjust signal. You can monitor different aspects of the flight using the ICONs middle left (Fig 5).

RADIO allows you to monitor the signal (Don't adjust)

PLOT displays Time vs T/RH/P or Time vs Spd/Dir Fig 10

You can zoom in and out

GPS displays GPS satellite positions in the sky

Between GPS and Plot, this ICON displays the trajectory of the balloon in a polar plot

Fig 5-"13"

The tabs are:

System = Sounding and sonde information

Raw PTU = 1 sec T/RH/P data

Raw GPS = 1 sec GPS data

EDT = 2 sec edited thermo and wind data

STD = Standard levels (sfc, 1000, 925, 850,…mb)

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
Sounding will terminate automatically as a rule.
If you click on System (Fig 5 it will display details about the sounding and how it terminated (normally balloon burst).
Then Click on Control (Fig 5) to finish termination

When sounding has terminated it will have the following message:

Request Climate

Not checked

Click Next

Request Archive

"Make sure Archive is checked"

Click Next

Sounding Ready for Termination

Click Next

System will now start to terminate sounding which may take several minutes. When done the main screen will go back ready for New Sounding.

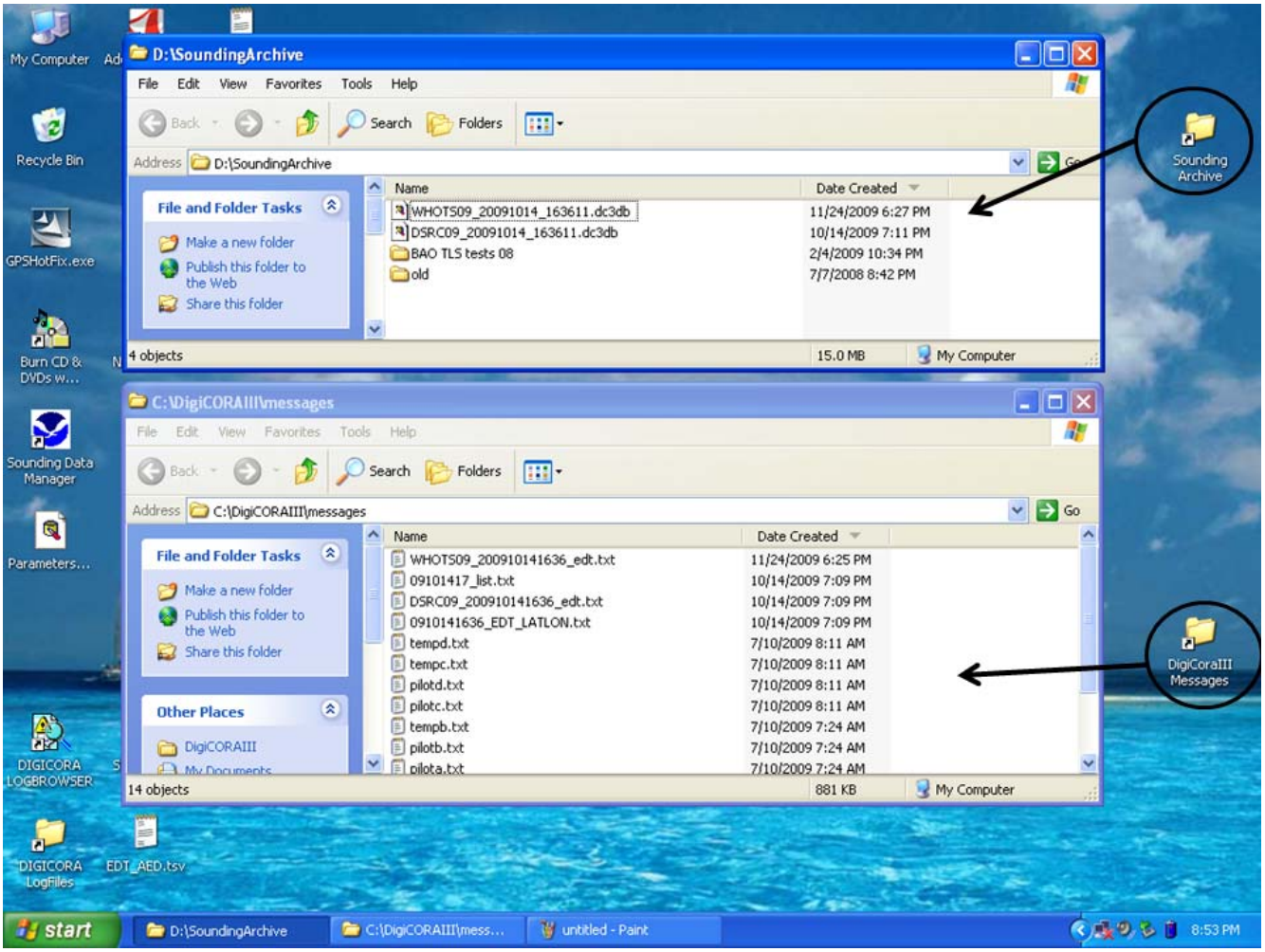
Note "Active" should no longer appear (Fig 5-"1")

Turn off Helium tank and release pressure in the hose

Close DigiCORA window
You should be able to leave the laptop the SPS220 on between soundings.
Use green logbook to note problems with system.
Feel free to make notes on the launch sheets

For problems email:

Dan Wolfe	daniel.wolfe@noaa.gov	303-497-6204
Chris Keenan Vaisala	Chris.Keenan@vaisala.com	


My Computer
Recycle Bin
GPSHotFix.exe
Burn CD & DVDs w...
Sounding Data Manager
Parameters...
DIGICORA LOGBROWSER
DIGICORA LogFiles
EDT_AED.tsv
D:\SoundingArchive
File Edit View Favorites Tools Help
Back Search Folders
Address D:\SoundingArchive
File and Folder Tasks
Make a new folder
Publish this folder to the Web
Share this folder
Name
Date Created
WHOTS09_20091014_163611.dc3db 11/24/2009 6:27 PM
DSRC09_20091014_163611.dc3db 10/14/2009 7:11 PM
BAO TLS tests 08 2/4/2009 10:34 PM
old 7/7/2008 8:42 PM
4 objects
15.0 MB
My Computer
Sounding Archive
C:\DigiCORAIII\messages
File Edit View Favorites Tools Help
Back Search Folders
Address C:\DigiCORAIII\messages
Go
File and Folder Tasks
Make a new folder
Publish this folder to the Web
Share this folder
Other Places
DigiCORAIII
Name
Date Created
WHOTS09_200910141636_edt.txt 11/24/2009 6:25 PM
09101417_list.txt 10/14/2009 7:09 PM
DSRC09_200910141636_edt.txt 10/14/2009 7:09 PM
0910141636_EDT_LATLON.txt 10/14/2009 7:09 PM
tempd.txt 7/10/2009 8:11 AM
tempc.txt 7/10/2009 8:11 AM
pilotd.txt 7/10/2009 8:11 AM
pilotc.txt 7/10/2009 8:11 AM
tempb.txt 7/10/2009 7:24 AM
pilotb.txt 7/10/2009 7:24 AM
pilota.txt 7/10/2009 7:24 AM
14 objects
881 KB
My Computer
DigiCoraIII Messages
start
D:\SoundingArchive
C:\DigiCORAIII\mess...
untitled - Paint
8:53 PM

There will be two EDT files and a binary file created for each launch

WTEC_20081007_141534.dc3db (WTEC is ship code for the Ron Brown)

YYYYMMDD_hhmmss

Binary file is in cC:\DIGICORA\Archive

EDT ASCII files are in C:/DIGICORAIII/messages

0810071415_EDT_LATLON.txt

YYYYMMDDhhmm

RS Serial #: Z4127141
Station Name: WTEC
Launch Time: 1415Z
Launch Date: 07 OCT 08

EDT LEVEL OUTPUT with GPS Lat, Long, Alt

Time	Height	Pressure	Temp	Dew P.	RH	W Spd	W Dir	Lat	Long	GPS Alt
sec	mtrs	hPa	øC	øC	Pct	m/s	Az ø	Decimal ø	Decimal ø	mtrs
-0.10	7.0	1008.0	25.65	25.3	98	8.0	290.0	-999.9900000	-999.9900000	-100000.0
0.90	12.4	1007.4	25.60	24.8	96	8.3	282.0	-999.9900000	-999.9900000	-100000.0

WTEC_200810071415_edt.txt

YYYYMMDDhhmm

RSZ4127141
WTEC
1415Z 07 OCT 08

EDT LEVEL OUTPUT

Time	Height	Pressure	Temp	Dewpt	RH	Speed	Dir
Sec	mtrs	hPa	degC	degC	Pct	m/s	deg
0	7	1008.0	25.7	25.3	98	8.0	290
2	19	1006.6	25.6	24.4	93	8.6	273
4	27	1005.7	25.6	24.3	92	9.1	258

Copy these files to D:/data/cruise name directory on laptop

On ship archive binary and edt files to hard drive

Trouble shooting:

SEE USER MANUAL on laptop for more details!!!!!!!

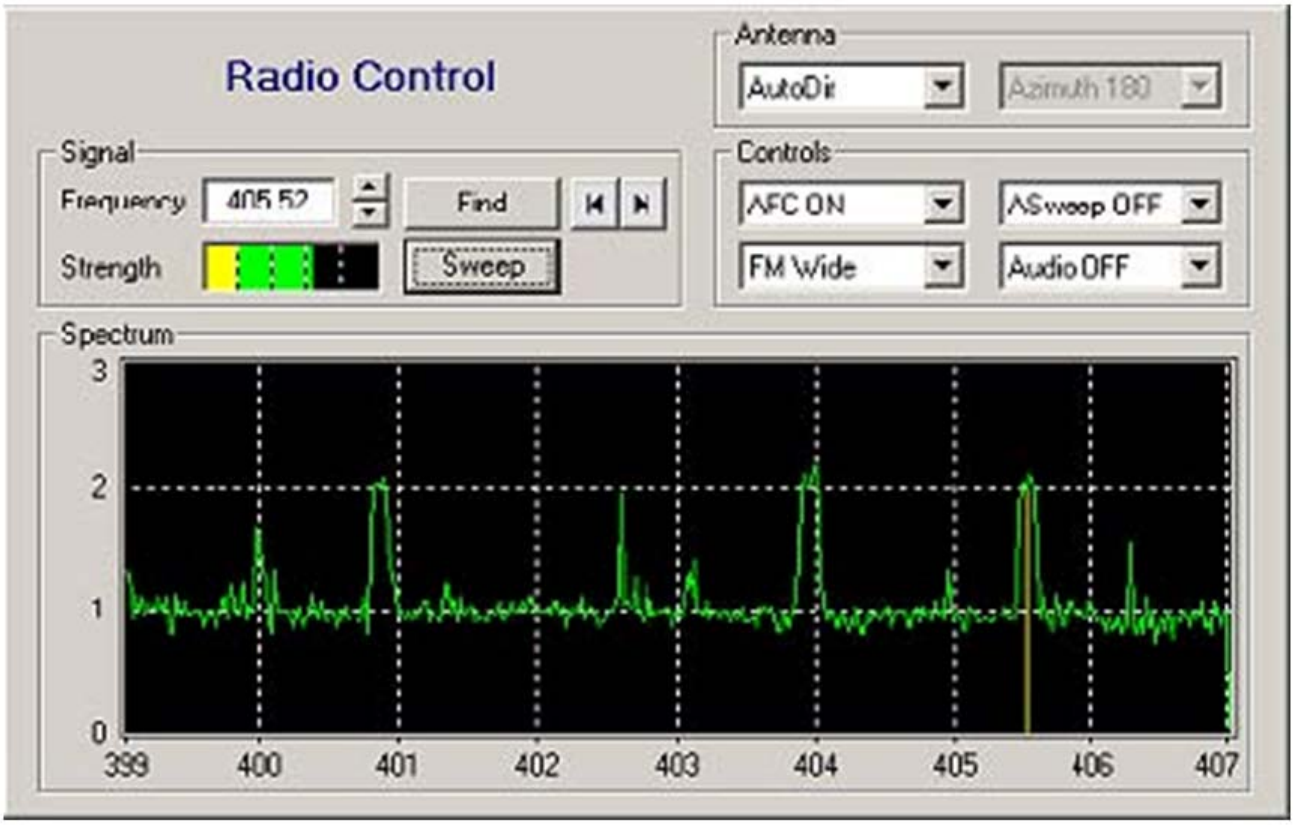
If no GPS satellites:

Check flashing green light inside SPS220 (looking down from the top)

Each flash = 1 satellite need 4 green lights in a row for winds

If no signal:

Click on RADIO ICON



Click Find……Signal peak should appear at sonde Freq

Sonde freq is normally around 403 MHz

For RS92 sondes, this is the freq selected using the GC25

Double click on this peak if vertical yellow line isn't already there

Should have 3-4 green bars signal strength

Change Antenna to "AutoDirectional for the Ron Brown antenna or Omni for PSD portable antenna"

If you have a speaker connected to the SPS220, then you can listen to the sonde signal

Click on Audio Off and select Audio on

Go back to Control (picture of sonde) window

To check GPS satellite configuration:

Click on GPS ICON (Fig 4)

You need to lock onto 4 sonde satellites with everything green on the left to launch.

To manually terminate a launch:

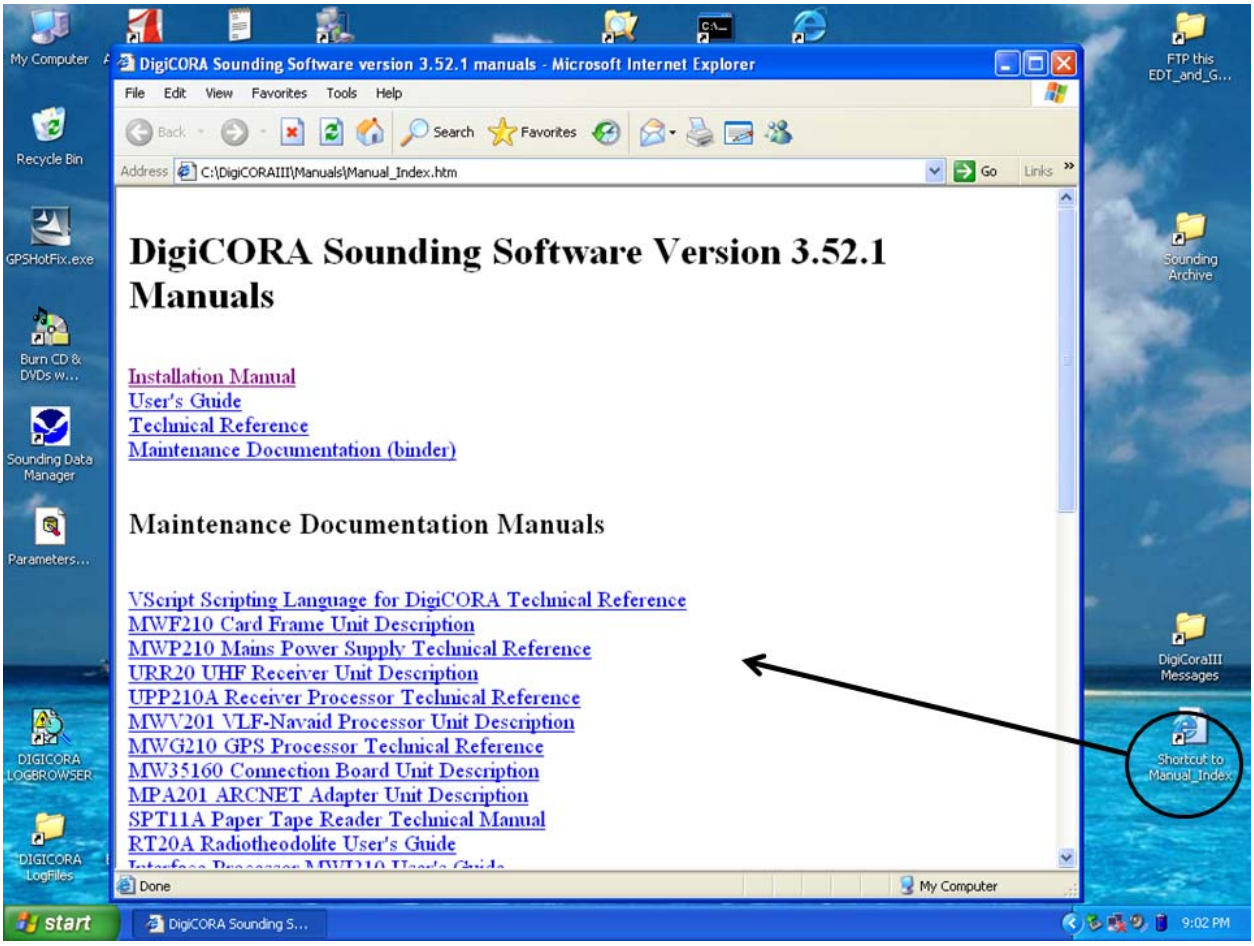
Don't ever just kill the main window!!

Read Users Manual

For the next sounding if for some reason you have problems getting LOCAL GPS:

Close the DIGICORA window (Stop sound using F2 command) and power OFF/ON SPS220

Manuals can be found on the laptop for more details CLICK on ICON



Guide for Launching Radiosondes

**********Brief VERSION**********

Sounding system will have been checked out prior to cruise confirming that everything is working

Power up ground check station
Power up the SPS220
Power up Laptop
Login as administrator (no password required)
Wait for LAN connection to SPS220 (icon by clock…takes a minute or 2)
Unpack sonde
Carefully connect sonde to ground check station (GC25)
Start DigicoraIII software (ICON)
Have you set new station position and site name (prior to first launch only)?
Click New Sounding
Click Next (Read in Coefficents)
Click Next (Set Sonde type and change freq)
If you need to change freq Click on Set, change (~.5MHz up or down)
Click Next (Triggers)
Click Next (Research Mode)
Click on >>
Click Next (GPS)
Uncheck "Manual" and Check "Automatic"
Click Next
Click Recond
Click Record (again)
********** **For water activated battery ONLY**
Now is the time to activate the battery during this 5 min.
Click Next
Click Next (Don't perform Ground Check)
****
Take battery out of water or package if Lithium battery
Shake gently to remove excess water
Make sure PTU data are cycling in sounding window and they are good values. If RH is >2% whne sonde is in GC25, change dessicant. Wait for RH to readjust, which shouldn't take more than a min.
Disconnect and Remove sonde from ground check station
Connect battery to radiosonde
Attach plasticbattery case to sonde body
Check sonde is retransmitting data and signal strength is good
Place T/RH sensor arm in launch position
****
Take radiosonde outside
Return to Laptop and check to see how many SONDE satellites are visible
Click on Surface Obs
Enter surface obs
Click Next

Record surface obs on log sheet
Click Next (Nothing entered for clouds)

Call bridge and inform them you will be releasing in 5-10 mins

Make arrangements with FOO and Chief Scientist how ship will operate during launches. In strong winds you may want to ask the ship to position the wind off the Port or Starboard quarter for easier release.

****

Go to launch area (Staging Bay on ship)
Inflate balloon
Inflate with 400-450 psi (shooting for an ascent rate of 5 m/s).
Place Sensor boom into Launch Position
Attach balloon to sonde unwinder
Make sure string is free to unwind (pull little rubber stopper Fig 3)

Walk sonde to open area on deck
Launch when ready
Take weather obs (clouds, seas, precip, etc)
Finish filling in log sheet
Shut-off helium tank and release pressure in hose

When sounding is Terminated

Click Next
"Make sure Archive is checked"
Click Next
Click Next

System will now start to terminate sounding which may take several minutes. When done the main screen will go back ready for New Sounding.

There are 3 major files you need to archive
WTEC_YYYYMMDD_hhmmss.dc3db binary file
WTEC_YYYYMMDDhhmm_edt.txt ASCII file
YYMMDDhhmm_EDT_LATLON ASCII file

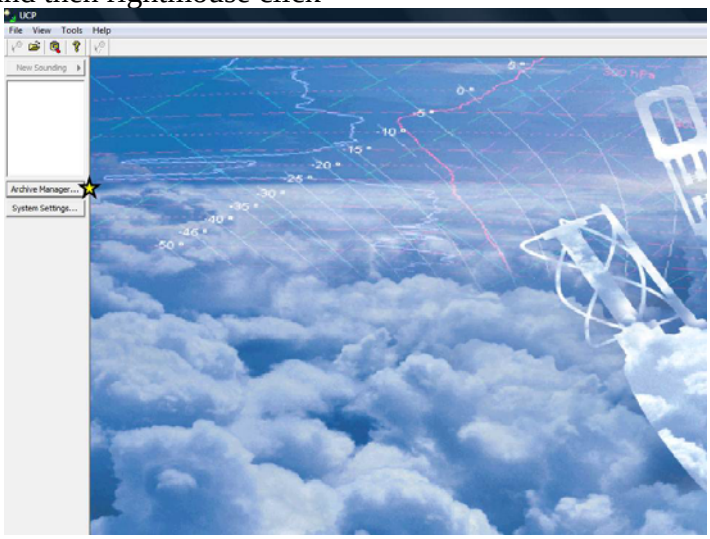
I put these into D:\CALNEX_2010\Atlantis\balloon\raw\dc3db or D:\CALNEX_2010\Atlantis\balloon\raw\dc3db or

Drying Desiccant

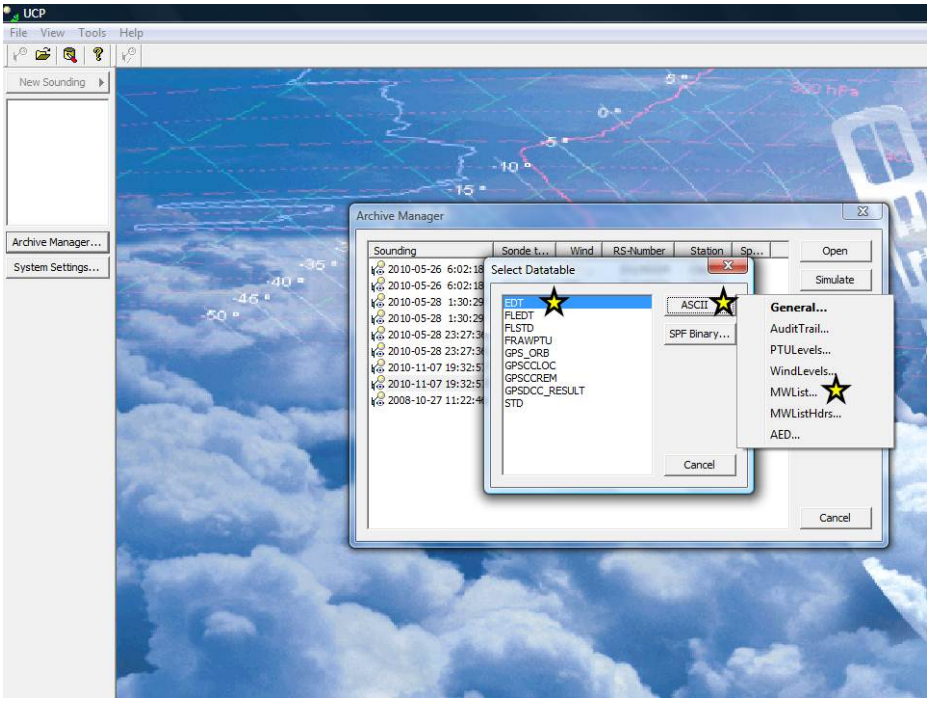
250^{o} C for 3 hours

Generating Mandatory level file for HMT:

After flight is finished and you have successfully Archived the data.
Go to the Archive Manager (left side of Sounding Window)
Select the sounding and then rightmouse click



Click on Export->
Select Convert
Select EDT under datatable
Select ASCII button
Select MWList



Enter filename: lhmYYYYMMDDhhmm_mand_sig.txt (lower case site name)
I would suggest DIGICORAIII/messages. This is the same place the other ASCII files are going.

Manual Termination

A sounding can be stopped manually at any time by doing the following:

Click the **Cmd** button on the **Control pane**. The following window will appear.

If you click **Exit**, the sounding will be stopped immediately without saving the data.

If you click **Manual stop**, the sounding will be stopped and you will be asked to archive the data as shown in Figure 79 on page 78. The **Manual stop** button is shown when EDT data is available and the sounding has started.

If you click **Cancel**, the operation will be cancelled.

CAUTION	If you need to stop the sounding before it ends automatically, it must be done as described above. Closing the UCP is not the same thing as stopping the sounding manually.
NOTE	After the sounding has ended, it is important to turn off the power from SPS311 or SPS220. Archive the sounding and close the UCP before turning off the power.

Radiosonde Flight Log

Experiment:___
Location:_____
Date/Time of Launch :_____(UTC)
Launch Crew:_____
Sonde type: RS-92G Ser No._____

Surface Obs fm SCS:
T (C):_____ RH (%):_____ Press (mb):_____
WSpd (m/s)_____ WDir (T):_____

Use for SFC OBS in system
Surface Obs fm Sonde (acclimating outside in shade):
T (C):_____ RH (%):_____ Press (mb):_____
Local Satellites:_____ Sonde satellites:_____

Sonde Freq:_____
Helium (lbs):_____

Weather Obs:
Clouds:_____ Cloud Cover:_____
Precip:_____

Comments:

Max Ht (m):_____ Min Press (mb):_____
Reason for Termination:_____