Important phone numbers

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To do list

1. Unpack the station and visually inspect the contents for damage. If there is damage, immediately report this to Bryan/Mark/Sam.
2. Locate adequate storage space for sondes and gear.
3. Setup the ozone test unit. Make sure it is working properly. Setup, solutions, syringes, (We will include a couple of liters of deionized, distilled water for rinsing).**BUY DISTILLED WATER BEFORE YOU GET ON THE HELICOPTER,**) filter, pressure gauge, stop watch, and pliers.
4. Condition at least 6sondes n the first day of your arrival. Unless you fly more than one per day then the 10^{th} sonde will have sat with solutions for quite a while. You can fly sondes that have been conditioned 2-5 days ago. They seem to give less noise and spikes at the 15-20 km level and still have low backgrounds.
5. Once you have conditioned the sondes, you will need to setup the station workspace and unpack the rest of the station.
6. Locate a spot where you can place the mobile antenna. The antenna should have an unobstructed view of 45/360 degree angle. Make sure that you have at least 30 degrees clearance from the vertical. **Decide whether you want to anchor the antenna, or drag it in/out with every launch**. Antenna is on a tripod with about 30 feet of cable – I agree it may be easier to keep it inside except during the flight. Mount antenna to tripod at an elevation angle of 45 degrees. I would recommend moving the antenna in and out with every launch. This is what I did at Nashville and Houston and it helps avoid a whole set of complications.

Make sure you are in full compliance with FAA regulations on unmanned balloons. Ozonesondes fall under the category of the regular radiosondes, confirm this with the team or FAA before you start launching. **Usually this involves informing the FAA PRIOR to launch of the expected launch time so they may send out a NOTAM**. Finding who to contact to let them know that you will be launching weather balloons is not always easy. Usually at remote sites we contact the closest local airport to let them know. Have the Houston FAA clearance information ready in case the person you talk to has some questions. Here is some of the information (You requested for Houston project) that you may need regarding flying the radiosonde/ozonesondes.

When filled, the weather balloon diameter is about 6 feet depending on altitude. At sea level it may be slightly less than 6 feet.

At surface the air pressure and temp. over Trinidad Head is 1014 hPa and 15 C
At 45,000 feet the air pressure and temp. over Trinidad Head is approximately 150 hPa and –60 C.
The 5.5 feet diameter balloon will stretch to about 10 feet in diameter at 45,000.

The total weight of the ozonesonde with everything but the balloon is 1030 grams (2.3 lbs)
The balloon weight is 1200 grams.

Here is more detailed information for the weights:
120 grams = payout reel
75 grams = parachute
80 grams = 2x 9 volt lithium battery pack
257 grams = ozonesonde (pump/cell/board) The pump frame is 3 x 3.5 x 5 inches
168 grams = Vaisala radiosonde with wet cell.
230 grams = Styrofoam box.
50 grams = string to tie on parachute

Maximum altitude is 110,000 feet
Rise rate is 1000 feet per second on ascent.
Descent rate is approximately 1500 feet per second in troposphere.
Total time in air is about 2.5 hours.

The payout reel has 120 feet of string. The string is 50 lb. test (breaks at 50 lbs.).
The Styrofoam box dimensions are: 19x19x25 cm.
The Vaisala transmits at 403 MHz, 0.25 watts, which can be tuned up or down by 2 or 3 MHz. The bandwith is about 0.2 MHz.

7.

8. The day before you do your first launch, make a practice run by inflating a balloon with a tether (we will send an older 600 gram balloon and an old box and used vaisala for this) and practice launching the balloon under lighthouse conditions. You can attach an empty sonde box with a small weight in it. If you loose the balloon, be sure to ask Bryan to send an extra BOX!!!

9. Using the receiver do a scan for WFM signals around the 403.5 MHz region. Decide which frequency is the clearest and best to use. Try 402.5 as we do in Huntsville as a starting point.
10. Remember that the time zone at the lighthouse is **GMT -5, and not GMT -6** as is the case in Huntsville now. Remember to make that change when entering data in strato.exe for the first time.
11. **Set the computer time to GMT**.

Things to watch out for

- **General troubleshooting problems. If you have a problem that you do not know how to address, call Mohammed/Bryan/Mike. EVEN AT 3:00 AM!!!**
- Try and put as much clearance as possible between your launch point and the edge of the platform so as to avoid having the balloon nose-dive into the water.
- **PRACTICE** your windy-condition launches. We will include an old 600 gram balloon that you can use for a first practice or test run to see how the tarp and wind conditions are with a real balloon. Then you won't have to sacrifice one of the 1200 gram balloons.
- Breakage or loss of equipment while at the lighthouse. Standard procedure would be to inform Bryan/Mark/Sam and Mike/Mohammed.
- Be sure to collect the correct meteorological data for your region (Atlantic and NE.)
- **Make sure that the launch path is clear of sharp objects around you. Make sure you have 14 ft. clearance, i.e. 7ft. clearance on either side**.
- Make sure that people who are assisting you are aware of what to touch and what not to touch, e.g. no one should touch the balloon with bare hands. If someone does touch the balloon while inflating or ready to launch – it is okay to go ahead with the launch. The balloon will most likely be fine.

Frequently Encountered Problems

- If you get readings of 99999 for ozone pressure or mixing ratio, this means that your background is higher than the value strato is measuring for ozone. **Fix**: press F9 immediately once you see the reading 99999. This will show the lowest current reading at the time, press enter and that reading will be used as the background for strato. Repeat this until you have a stable background for at least a couple of minutes. Enter this new background into the checkout sheet. This problem usually occurs with sondes that are launched less than a week from the initial prep. Lately we have found the sondes are less noisy (no spikes at the typical 15-20 km altitude) when the solutions sit for shorter time periods. The last two

Boulder flights were given the high ozone conditioning 1 day and 2 days before flight. Much cleaner profile was obtained and the Background was fine (around 0.01 to 0.02 microamps on zero air cylinder. A situation that you will likely encounter.

- At the bottom of the screen, instead of seeing numbers, you get strange characters. This is usually an input error from strato. **Fix**: Exit strato.exe, then run strato.exe, press F-12, make sure the values in order are; No, No, 0.100, High, Launch, Yes, No, V2C (V2C is the most important option to have selected to read the incoming data – it will be the default on the computer), 0.0, 1ZAVG, 2%, no Buffer, No.
- Premature loss of signal. **Fix**: Make sure that all connections are good. If you still cannot locate a signal, slowly rotate antenna on tripod to try and find a stronger signal. Make sure there are no obstacles between the antenna and the direction from which the strongest signal is coming.
- Background does not fall below 0.05 uamps. **Fix**: Empty cathode and anode solutions, rinse cathode cell with distilled water, then with cathode solution and start over. Repeat this up to three times if necessary. With each time the background should drop from the value before. If after three attempts the background does not fall below 0.05 uamps, then use a different sonde and store this sonde for later use**. Let this sonde sit for at-least another three days before launching**.
- Response time higher than one minute. **Fix**: Same fix as that for the high background above.
- Signal on the receiver is static-y. Fix: Make sure the receiver is set to **WFM, not FM**. Also, make sure that **AFC is ON**. And ATTN (attenuation) is OFF. Sometimes these buttons can be accidentally pushed. You can always test and push the Attenuation button to see the ATTN light come on the receiver screen. Then push the button again so ATTN light goes out (OFF). Also be sure Squelch knob is turned all the way down. Turning it up will get to a point where the signal disappears. But this probably will be unlikely to happen.
- Strato does not recognize the vaisala number you entered. **Fix**: You likely have not copied the vaisala calibration files to the correct directory. Locate the disk with the vaisala calibration files and copy the content to the SAME directory in which strato.exe is located. You can also put the Vaisala disk into the floppy drive on the computer and Strato.exe will find it. Restart strato.exe. It should work this time.