

Radar Scientist

Flight ID 20130915H1 Storm INGRID Radar Scientist HUA CHEN

The on-board radar scientist is responsible for data collection from all radar systems on his/her assigned aircraft. Detailed operational procedures and checklists are contained in the operator's manual. General supplementary procedures follow. (Check off or initial.)

Preflight

- ___ 1. Determine status of equipment and report results to lead project scientist (LPS).
- ___ 2. Confirm mission and pattern selection from the LPS.
- ___ 3. Select the operational mode for radar system(s) after consultation with the LPS.
- ___ 4. Complete the appropriate preflight check list.

In-Flight

- ___ 1. Monitor the Tail Doppler Radar function regularly, using the realtime TDR display, to make sure the Doppler radar is scanning and working normally.
- ___ 2. Maintain the Doppler Wind Parameter form as well as a written commentary in the Radar Event Log of event times, such as ending and restarting of radar recording. Also document any equipment problems or changes in R/T, INE, or signal status.

Post flight

- ___ 1. Complete the summary checklist and all other appropriate forms.
- ___ 2. Download all Tail (TA) radar data files to thumb drive.
- ___ 3. Brief the LPS on equipment status and turn in completed forms and thumb drives to the LPS.
- ___ 4. Debrief at the base of operations.
- ___ 5. Determine the status of future missions and notify HFP Director as to where you can be contacted.

HRD Radar Event Log

Flight ID 20130915H1 Aircraft _____
 Radar Scientist _____ Radar Technician _____

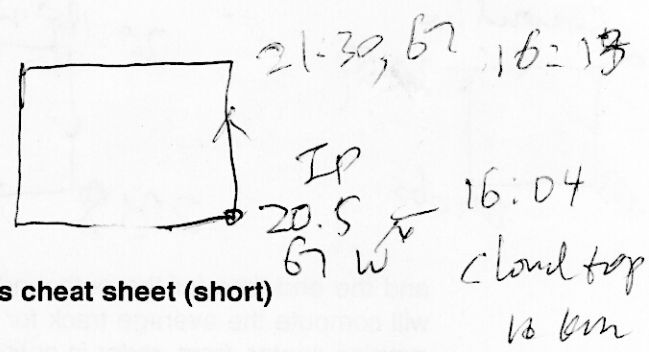
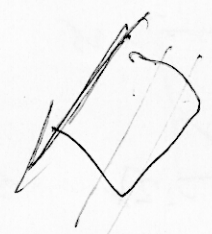
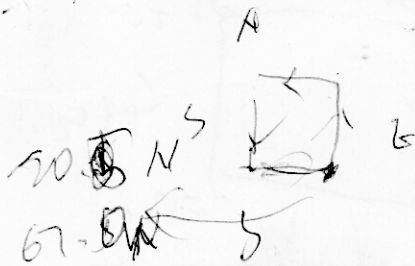
(Include down time and times of when recording ended and was restarted)

Time (HHMMSS)	Event	
08:16:15	23° 29' 55"	93° 0' 20"
08:28:23	22° 54' 31"	94° 39' 20"
08:43:00	22° 16' 18"	95° 23' 44"
outbound	225°	
	At front inbound. Saw a lot of lightning and Radar with 25-30 dBZ reaching over 18 km.	
	rainband organized in the DS/DSL direction, not much lightning in the enbound.	
	22° 16' 8"	095° 19'
	8m updraft 8m downdraft.	
Center	N 22° 20'	95° 27' 10=10
turn.	10:37:55	23° 21' 54" 96° 28' 1"
center	22° 20' 10N	95° 33' 41" 10:58:20
turn	11:23:59	23° 30' 16" 94° 15' 4"

IP.
drop center.

turn.

turn



Automated radar analysis cheat sheet (short)

[Note: If HRD radar scientist is on the ground, they will convey radar preferences in Steps 1-2 to an AOC crewmember via xchat.]

- 1) Make sure radar is operating in single-PRF. Data should be recorded with a PRF of 2100. Ask radar operator to record 1 sweep per file. *There should be a task name listed here for the radar operator. If it is not here, replacing this text, ask John Gamache or Paul Reasor if they know.*
- 2) Make sure antenna is switching fore and aft. This may be harder to verify with your eye this year, but just make sure with the radar operator.

1700
 1500
 400
 2500
 1000

[Note: If HRD radar scientist is on the ground, an AOC crewmember will perform Steps 3-8.]

- 3) Open a terminal on linux radar workstation. Make sure the path has /home/hrd at the beginning, by typing **"export"**, and looking for the line showing you the path. If not, type: **'export PATH=/home/hrd:\$PATH'**
- 4) Once radar recording begins, start the rsync of data from the RVP-8 computer, by running the command **startRawCopy**. When you are asked to enter a flight id, it should be of the form YYYYMMDDAI, where A is 'H', 'I' or 'N', and I is '1' or '2'. Do an ls of /home/hrd/YYYYMMDDAI to make sure files are populating the directory.
- 5) Type **"initial_cleanup"**. **Do this at the beginning of the flight only.**
- 6) Type **"check_ftp"**. This will open a separate terminal window that will run a script to send Doppler analyses and superobs via sftp to AOC ftp site, where it will be transferred to AOML.
- 7) Double-click desktop **"aircraftTailRadarProcessor"** icon. This will open a separate terminal window and run a script that will look for new data and convert it to NCO format. If icon does not work:

```
~/aamps/bin/aircraftTailRadarProcessor.py -f ~/aamps/etc/datarelay/taradar.cfg
```
- 8) Double-click desktop **"ftpDataFiles"** icon. This will open a script that will look for new NCO files and transfer them to netman, another computer on aircraft, for transfer to AOC and on to NCO. If icon does not work:

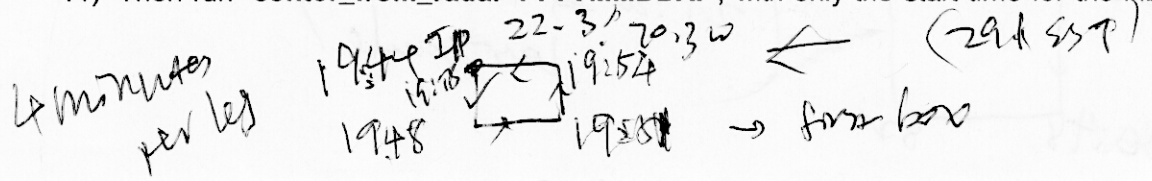
```
~/aamps/bin/ftpDataFiles.py -f ~/aamps/etc/datarelay/ftpInfo
```

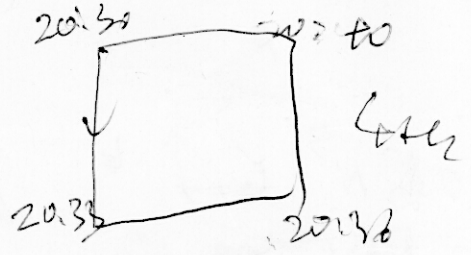
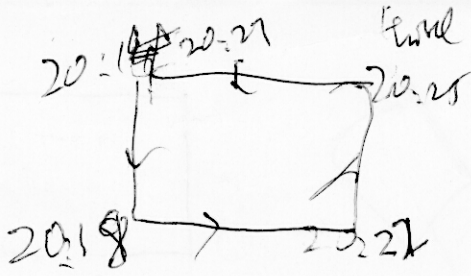
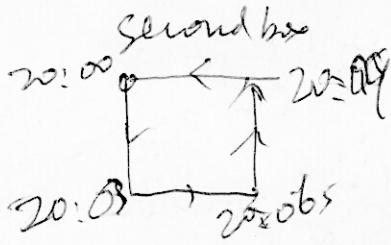
[Note: If HRD radar scientist is on the ground, they will obtain the information in Step 9 via xchat with AOC crewmembers.]

- 9) Note the times of the beginning of flight legs into the storm, the track into the storm, the center information, the track out of the storm, and the end of the radial legs. Also record beginning and ending times of downwind legs. Continue to do this throughout the flight. Obtain information concerning storm center location and motion from flight director or navigator. Forms specifically designed for this should be in the flight bag.
- 10) After radial penetration and downwind leg are complete, wait until RVP-8 Doppler files in /home/hrd/YYYYMMDDAI are available past time of end of downwind leg. You will be able to tell by doing an ls of /home/hrd/YYYYMMDDAI since the file names include the time.

[Note: If HRD radar scientist is on the ground, Step 11 will not be performed. The HRD radar scientist will create jobfiles following Step 12 and then transmit them to the aircraft.]

- 11) Then run **"center_from_radar YYYYMMDDAI"**, with only the start time for the inbound leg,





and the end time for the outbound leg to set up the cross-sections for jobfile_display. This will compute the average track for the legs inbound to and outbound from the center. *Note: running center_from_radar is optional. The program "jobfile_display" will work fine without it. It allows you to display the flight track so you can check your notes, and confirm your inbound and outbound tracks. All of these can be fed into jobfile_display without running center_from_radar.* *Note: occasionally center_from_radar may not get the center position correctly or the beginning and end times, and sometimes this may cause a problem for "jobfile_display". If you get an error message when trying to run jobfile_display, then run jobfile_reload and try again. At this point you may need to enter all the data in the first two columns again.*

- 12) Run "jobfile_display" (Once the jobfile_display X11 window opens, do not resize it.) Pay close attention to all variables in the first two columns, being sure the flight id corresponds to the one you enter when running startRawCopy (minus the 20 at the beginning—form for "jobfile_display" flight id is YYMMDDAI). The storm motion is usually incorrect so use the one from the navigator/flight director. *Note: "jobfile_display" requires that you first click on the window where you want to change a parameter and then click again on the parameter. Then you must click on the text window, and then enter the new value for the parameter.*

[Note: If HRD radar scientist is on the ground, they will notify an AOC crewmember of the jobfile transmission and execute 'check_radar_progress.pl' to monitor the progress of the automated radar analysis software on the aircraft. The AOC crewmember will then perform Step 13. Upon successful completion of 'ja', the HRD radar scientist will monitor the transmission of files to the ground in Step 15.]

- 13) After running "jobfile_display", and being satisfied you have entered the parameters correctly run either "ja or ja_graphics", depending on whether you want to see the sweeps as they are processed. This should then run through the entire analysis, and make superobs, if all goes well. It will then copy all the files into archive directories and into the ftp directory: /home/hrd/ftpd. check_ftp should then send the completed files securely to AOC site. **Note: Since training, ja_ts and ja_graphics_ts have been added. Use these in TS or less.**
- 14) Repeat 9-13 for each penetration/downwind-leg combination
- 15) Check occasionally to see if files are being sent from the aircraft. Generally, the person following you on xchat will be the one to let you know.

[Note: If HRD radar scientist is on the ground, an AOC crewmember will perform Step 16.]

- 16) At the end of the flight after the last analysis is finished, run "makearchive." This will copy the new files made in that flight that are in /home/hrd/radardata, and the new files in /home/hrd/wfiles and /home/hrd/SO/SO/save. They all have names indicating the flight ID. It will also copy all the raw RVP8 Doppler files in /home/hrd/YYYYMMDDAI to the thumb drive. "makearchive" should create a tar file with all the above named "thumbYYYYMMDDAI.tar.gz" which you can copy on a thumbdrive. It will be 1.5-3 GB in size. If for some reason "makearchive" fails (it is a new command untested in flight), do the above copies manually. If you get an error message at the end such as tar: Error exit delayed from previous errors. This means there was one type of file not found, but the tar finished successfully. Just copy the thumb....tar.gz file to the thumb drive.

