

## ACTIVE Second Campaign Log

### Events

| Second Campaign |  |
|-----------------|--|
| 14-Jan          | Monsoon has set in. Showers all around and northwesterly flow. Monsoon trough south of us.   |
| 15-Jan          | Monsoon intensifying   |
| 16-Jan          | Dornier moved from hangar. 2 days needed to pump AMS   |
| 17-Jan          | Despite extremely wet morning, Egrett makes it in in the much quieter afternoon. Data system worked OK, lidar didn't                           |
| 18-Jan          | Planned Do flight postponed because power supply failure caused loss of vacuum on AMS. Meeting with TWP-ICE Pis in the evening                 |
| 19-Jan          | Official opening and press day up to 11.00. Do test flight TD13 in the afternoon, round Tiwis. Egrett cloud physics payload installed          |
| 20-Jan          | First mission, AD14/AE17, to investigate squall line progressing N over Tiwis. Do measured along its length to the N, Egrett to the S          |
| 21-Jan          | Down day to get into synch with TWPICE.  |
| 22-Jan          | Joint flight AD015/AE18/Twin Otter looking at storm south of Darwin. Successful flight, only problem was with AMS.                             |
| 23-Jan          | Joint flight AE19/Twin Otter looking at dissipating anvil over the Timor Sea. Successful   |
| 24-Jan          | No flight today because of uninterrupted rain caused by squall line/MCS overnight  |
| 25-Jan          | All five aircraft flew today: we did SD16/AE20; Egrett did aged Ci anvil and Dornier survey mission round Tiwis                                |
| 26-Jan          | Survey flight SD17 to the south of Darwin, curtailed because of turbulence   |
| 27-Jan          | Four aircraft today: Egrett (AE21)/Proteus/TO looked at aged Ci anvil; Dornier (SD18) completed survey mission to the S                        |
| 28-Jan          | Down day as Egrett is converted to ozone lidar flights   |
| 29-Jan          | Down day as AMS is repaired on Dornier. TWP-ICE plan yet another aged anvil mission.   |
| 30-Jan          | Dornier flight SD19 to measure chemical equator. No Egrett flight due to aileron problem   |
| 31-Jan          | First Egrett lidar flight (LE22), curtailed because lidar didn't work. Planned Alice Springs flight. Ozonesonde problems.                      |
| 01-Feb          | Dornier flew to Alice Springs (SD20). Egrett lidar flight LE23 in evening - mission completed despite failure of lidar                         |
| 02-Feb          | Dornier back from Alice Springs (SD21). Egrett switched to cloud physics payload. Proteus/TO fly in anvils over Tiwis                          |
| 03-Feb          | Both aircraft do survey missions to the north: SD22 and SE24   |
| 04-Feb          | Deep dry layer prevented significant convection today.   |
| 05-Feb          | Down day again   |
| 06-Feb          | Joint flight with Proteus and TO into detached Hector anvil north and west of Melville Is. Do circulated storm at 1000 and 2000'               |
| 07-Feb          | Science meeting  |
| 08-Feb          | Jim's Hector flight - Do flight AD24 round developing convection and AE26 into anvil, with Twin Otter  |
| 09-Feb          | Best Hector of the whole campaign. AD25 flew right round inflow but oil pressure transducer failed on Egrett so only Twin Otter measured anvil |
| 10-Feb          | Another superb Hector; this time we got the mission done with AD26 and AE27 plus TO/Proteus.   |
| 11-Feb          | No fly today. Late Hector developed over Melville around 5.00  |
| 12-Feb          | Very suppressed day. Flew AD27 south of Darwin, then AE28 (aborted) into anvil that developed in storm just SW of Darwin, with Proteus/TO      |
| 13-Feb          | Suppressed again so we didn't fly Do. Storms blew up over Coburg 1230 and Tiwis 1610. Flew AE29 into Coburg storm anvil                        |
| 14-Feb          | Intercomparison flight: 3x60 mile dog-leg east and N of the Tiwis  |
| 15-Feb          | Egrett calibration flight. End of campaign   |
| 16-Feb          | Packing. Do leaves 9.00 for Bali.  |
| 17-Feb          | Egrett leaves 9.00 for Adelaide  |

## Dornier Flights

| Second Campaign: Dornier flights |        |         |          |       |      |   |
|----------------------------------|--------|---------|----------|-------|------|---|
|                                  | Flight | Science | Duration | Take  | Land | Flight plan   |
|                                  |        | Plan    | hours    | off   |      |   |
| 19-Jan                           | TD13   | test    | 2.3      | 1234  | 1453 | Clockwise round Tiwis at 2000' then legs at 5000'   |
| 20-Jan                           | AD14   | MA1     | 3.5      | 14:37 | 1806 | Transit to Cape van Diemen, eastward at 1000' to Coburg, back at 2000' then 5000' home          |
| 21-Jan                           |        |         |          |       |      |   |
| 22-Jan                           | AD15   | MA1     | 2        | 1621  | 1820 | Flight round storm system south of Darwin   |
| 23-Jan                           |        |         |          |       |      |   |
| 24-Jan                           |        |         |          |       |      |   |
| 25-Jan                           | SD16   | Survey  | 3.5      | 1404  | 1734 | Flight upwind and downwind of Tiwis with legs at 1000, 5000, 7500, 10000 and 2000               |
| 26-Jan                           | SD17   | Survey  | 3        | 1328  | 1623 | Flight S of Darwin with legs over coast at 5000 and 1000, then some work inland                 |
| 27-Jan                           | SD18   | Survey  | 3.2      | 1441  | 1752 | Flight S of Darwin with legs over coast at 5000, 1000, 2000, 7500, then inland 1000,2000, 5000  |
| 28-Jan                           |        |         |          |       |      |   |
| 29-Jan                           |        |         |          |       |      |   |
| 30-Jan                           | SD19   | Survey  | 4        | 1437  | 1843 | Flight to measure chemical equator. Legs at 1000, 2000, 3000 and 9000' with profiles in between |
| 31-Jan                           |        |         |          |       |      |   |
| 01-Feb                           | SD20   | Survey  | 4        | 1008  | 1408 | Flight to Alice Springs   |
| 02-Feb                           | SD21   | Survey  | 4.4      | 1007  | 1430 | Flight back from Alice Springs  |
| 03-Feb                           | SD22   | Survey  | 4.3      | 1410  | 1830 | Flight to measure chemical equator. Legs at 1000, 2000, 4000 and 9000' with profiles in between |
| 04-Feb                           |        |         |          |       |      |   |
| 05-Feb                           |        |         |          |       |      |   |
| 06-Feb                           | AD23   | MA1     | 3        | 1538  | 1834 | Hector flight with Egrett, Proteus and Twin Otter. Flew round Hector at 1000 and 2500'          |
| 07-Feb                           |        |         |          |       |      |   |
| 08-Feb                           | AD24   | MC1     | 3.6      | 1308  | 1643 | Hector flight with Egrett and Twin Otter  |
| 09-Feb                           | AD25   | MC1     | 3.9      | 1300  | 1650 | Intended Hector flight (but Egrett failed)  |
| 10-Feb                           | AD26   | MC1     | 4        | 1305  | 1705 | Flight initially S of Darwin then around Hector   |
| 11-Feb                           |        |         |          |       |      |   |
| 12-Feb                           | AD27   | MA1     | 3.2      | 1307  | 1618 | Flight in box pattern S of Darwin. Partner to AE28  |
| 13-Feb                           |        |         |          |       |      |   |
| 14-Feb                           | AD28i  | MI      | 2.8      | 1210  | 1500 | Intercomparison flight: 3x60 mi dog-legs at 10, 7 and 3 kft                                     |
| 15-Feb                           |        |         |          |       |      |   |
| 16-Feb                           |        |         |          |       |      |   |
| 17-Feb                           |        |         |          |       |      |   |
|                                  |        |         |          |       |      |   |
| Hours this campaign              |        |         | 54.7     |       |      |   |
| Total hours                      |        |         | 96.65    |       |      |   |

Dornier Equipment

| Second Campaign: Dornier instrument status                        |       |     |     |       |      |     |       |         |       |    |     |     |      |       |                        |
|---|-------|-----|-----|-------|------|-----|-------|---------|-------|----|-----|-----|------|-------|------------------------|
| n: not flown, x: not working, p: part working, y: working         |       |     |     |       |      |     |       |         |       |    |     |     |      |       |                        |
|   | AIMMS | AMS | CPC | UHSAS | PSAP | ASP | Grimm | Filters | Ozone | CO | VOC | CFC | FSSP |       |                        |
| 19-Jan  | y     | y   | y   | y     | y    | y   | y     | n       | y     | y  | y   | y   | y    | TD13  |                        |
| 20-Jan  | y     | y   | y   | y     | y    | y   | y     | y       | y     | y  | y   | y   | y    | AD14  |                        |
| 21-Jan  |       |     |     |       |      |     |       |         |       |    |     |     |      |       |                        |
| 22-Jan  | p     | y   | y   | y     | y    | y   | y     | y       | y     | y  | y   | y   | y    | AD15  |                        |
| 23-Jan  |       |     |     |       |      |     |       |         |       |    |     |     |      |       |                        |
| 24-Jan  |       |     |     |       |      |     |       |         |       |    |     |     |      |       |                        |
| 25-Jan  | p     | y   | y   | y     | y    | y   | y     | y       | y     | y  | p   | y   | y    | SD16  |                        |
| 26-Jan  | p     | y   | y   | y     | y    | y   | y     | y       | y     | y  | y   | y   | y    | SD17  |                        |
| 27-Jan  | p     | y   | y   | y     | y    | y   | y     | y       | p     | y  | y   | y   | y    | SD18  | no drier on ozone unit |
| 28-Jan  |       |     |     |       |      |     |       |         |       |    |     |     |      |       |                        |
| 29-Jan  |       |     |     |       |      |     |       |         |       |    |     |     |      |       |                        |
| 30-Jan  | p     | y   | y   | y     | y    | y   | y     | y       | y     | y  | y   | y   | y    | SD19  |                        |
| 31-Jan  |       |     |     |       |      |     |       |         |       |    |     |     |      |       |                        |
| 01-Feb  | p     | y   | y   | y     | y    | y   | y     | y       | y     | y  | y   | y   | y    | SD20  |                        |
| 02-Feb  | p     | y   | y   | y     | y    | y   | y     | y       | y     | y  | y   | n   | y    | SD21  |                        |
| 03-Feb  | p     | y   | y   | y     | y    | y   | y     | y       | y     | y  | y   | y   | y    | SD22  |                        |
| 04-Feb  |       |     |     |       |      |     |       |         |       |    |     |     |      |       |                        |
| 05-Feb  |       |     |     |       |      |     |       |         |       |    |     |     |      |       |                        |
| 06-Feb  | p     | y   | y   | y     | y    | y   | y     | y       | y     | y  | y   | y   | y    | AD23  |                        |
| 07-Feb  |       |     |     |       |      |     |       |         |       |    |     |     |      |       |                        |
| 08-Feb  | p     | y   | y   | y     | y    | y   | y     | y       | y     | y  | n   | y   | y    | AD24  |                        |
| 09-Feb  | p     | y   | y   | y     | y    | y   | y     | y       | y     | y  | n   | y   | y    | AD25  |                        |
| 10-Feb  | p     | y   | y   | y     | y    | y   | y     | y       | y     | y  | n   | y   | y    | AD26  |                        |
| 11-Feb  |       |     |     |       |      |     |       |         |       |    |     |     |      |       |                        |
| 12-Feb  | p     | y   | y   | y     | y    | y   | y     | y       | y     | y  | n   | y   | y    | AD27  |                        |
| 13-Feb  |       |     |     |       |      |     |       |         |       |    |     |     |      |       |                        |
| 14-Feb  | p     | y   | y   | y     | y    | y   | y     | n       | y     | y  | y   | y   | y    | AD28i |                        |
| p for AIMMS refers to RH which seems to be incorrectly calibrated |       |     |     |       |      |     |       |         |       |    |     |     |      |       |                        |

## EGRETT flights

| Second Campaign: Egrett flights                                      |        |              |                |          |      |  |
|--|--------|--------------|----------------|----------|------|--|
|  | Flight | Science Plan | Duration hours | Take off | Land | Flight plan  |
| 17-Jan   | SE016  | Transit      | 7.7            | 900      | 1600 | Transit up from Adelaide   |
| 18-Jan   |        |              |                |          |      |  |
| 19-Jan   |        |              |                |          |      |  |
| 20-Jan   | AE017  | MA1          | 3.5            | 1505     | 1830 | E-W runs S of Tiwis at 33000, 36000 and 40000' behind squall line                          |
| 21-Jan   |        |              |                |          |      |  |
| 22-Jan   | AE018  | MC1          | 3.2            | 1630     | 1937 | Flight with Twin Otter SW from Darwin airport in anvil emanating from storm line           |
| 23-Jan   | AE019  | MC2          | 3.6            | 1224     | 1602 | Flight with TO through dissipating anvil over the Timor Sea                                |
| 24-Jan   |        |              |                |          |      |  |
| 25-Jan   | AE20   | MA2          | 4              | 1430     | 1830 | Flight with Proteus/TO E-W over Darwin in aged anvil plume                                 |
| 26-Jan   |        |              |                |          |      |  |
| 27-Jan   | AE21   | MA2          | 4              | 1500     | 1900 | Flight with Proteus/TO E-W over Darwin in aged anvil plume                                 |
|  |        |              |                |          |      |  |
| 31-Jan   | LE22   | Lidar        | 2.6            | 2022     | 2255 | Lidar flight south of Darwin, curtailed because lidar failed                               |
| 01-Feb   | LE23   | Lidar        | 3.3            | 2010     | 2330 | Lidar flight south of Darwin, to 15S then east   |
| 02-Feb   |        |              |                |          |      |  |
| 03-Feb   | SE24   | Survey       | 4              | 1442     | 1839 | Survey flight to the north, with SP2   |
| 04-Feb   |        |              |                |          |      |  |
| 05-Feb   |        |              |                |          |      |  |
| 06-Feb   | AE25   | MA1          | 2.8            | 1546     | 1833 | Hector anvil flight N of Melville, legs at 40000 and 42000'. Joint Proteus/TO              |
| 07-Feb   |        |              |                |          |      |  |
| 08-Feb   | AE26   | MC1          | 3              | 1700     | 2000 | Jim's Hector anvil flight over Bathurst, with TO   |
| 09-Feb   |        |              |                |          |      |  |
| 10-Feb   | AE27   | MC1          | 3.75           | 1644     | 2029 | Hector anvil flight over Bathurst, legs at 380, 400, 420, 440 and 380. Joint Proteus/TO    |
| 11-Feb   |        |              |                |          |      |  |
| 12-Feb   | AE28   | MA1          | 2              | 1716     | 1916 | Circumnavigation of anvil at 35000' in clear air (engine deicing failed). Joint Proteus/TO |
| 13-Feb   | AE29   | MA1/2        | 4.2            | 1525     | 1931 | Flight into anvil from storm over Cape Don area. FL 380, 410, 430, 460, 410                |
| 14-Feb   | AE30i  | MI           | 2.6            | 1213     | 1451 | Intercomparison flight east and north of Melville Is.                                      |
| 15-Feb   | TE31   | Test         | 3.7            | 1215     | 1600 | Calibration flight over Van Diemen Gulf  |
| 16-Feb   |        |              |                |          |      |  |
| 17-Feb   |        |              |                |          |      |  |
| 18-Feb   | SE32   | Transit      | 7.2            | 900      | 1610 | Transit to Adelaide  |
|  |        |              |                |          |      |  |
| Hours this campaign  |        |              | 50.25          |          |      |  |
| Hours both campaigns=  |        |              | 95.9           |          |      |  |
|  |        |              |                |          |      |  |
| Total so far   |        |              | 116.9          |          |      | including transits   |
| Assume 135 hours in total inc transits, and 7.5 hrs for last transit |        |              |                |          |      |  |
| Hours left =   |        |              | 10.6           |          |      |  |
| Active missions  |        |              | -2.35          |          |      |  |

# EGRETT Equipment

Second Campaign: Egrett instrument status

n: not flown, x: not working, p: part working, y: working

|        | CAPS | CDP | CPI | CO | O3 | CR-2 | TDL1 | TDL2 | VOC | GC | Met | NOX | TSI | SP2 | Lidar | Flight |  |
|--------|------|-----|-----|----|----|------|------|------|-----|----|-----|-----|-----|-----|-------|--------|--|
| 17-Jan | n    | n   | n   | n  | n  | n    | n    | y    | n   | x  | p   | n   | n   | n   | x     | SE016  | Transit flight   |
| 18-Jan |      |     |     |    |    |      |      |      |     |    |     |     |     |     |       |        |  |
| 19-Jan |      |     |     |    |    |      |      |      |     |    |     |     |     |     |       |        |  |
| 20-Jan | x    | n   | y   | y  | y  | x    | y    | y    | y   | x  | p   | n   | p   | y   | n     | AE017  | TSI2 data not logged. Flight E-W south of squall line over Tiwis       |
| 21-Jan |      |     |     |    |    |      |      |      |     |    |     |     |     |     |       |        |  |
| 22-Jan | y    | n   | y   | y  | y  | y    | y    | y    | y   | x  | y   | y   | y   | n   | n     | AE018  | Joint flight with TWPICE in fresh anvil S of Darwin                    |
| 23-Jan | y    | n   | y   | y  |    | y    | y    | y    | y   | p  | y   | y   | y   | n   | n     | AE019  | Flight with Twin Otter SW from Bathurst Is into dissipating anvil      |
| 24-Jan |      |     |     |    |    |      |      |      |     |    |     |     |     |     |       |        |  |
| 25-Jan | y    | n   | x   | y  | y  | y    | y    | y    | p   | x  | y   | n   | y   | y   | n     | AE20   | CPI logger stopped. Joint Proteus/TO in dissipating Ci over Dwn        |
| 26-Jan |      |     |     |    |    |      |      |      |     |    |     |     |     |     |       |        |  |
| 27-Jan | y    | y   | y   | y  | y  | y    | y    | y    | y   | y  | y   | n   | y   | y   | n     | AE21   | GC now fixed. Joint Proteus/TO in dissipating cirrus over Darwin       |
|        |      |     |     |    |    |      |      |      |     |    |     |     |     |     |       |        |  |
| 31-Jan | n    | n   | n   | y  | y  | y    | y    | y    | y   | y  | y   | n   | n   | n   | x     | LE22   | Flight to S of Darwin  |
| 01-Feb | n    | n   | n   | y  | y  | y    | y    | y    | n   | y  | y   | n   | n   | n   | x     | LE23   | Flight to S of Darwin to 15S then back along more easterly line        |
| 02-Feb |      |     |     |    |    |      |      |      |     |    |     |     |     |     |       |        |  |
| 03-Feb | y    | y   | y   | y  | y  | y    | y    | y    | n   | y  | y   | n   | y   | y   | n     | SE24   | Flight NE from Darwin to monsoon trough                                |
| 04-Feb |      |     |     |    |    |      |      |      |     |    |     |     |     |     |       |        |  |
| 05-Feb |      |     |     |    |    |      |      |      |     |    |     |     |     |     |       |        |  |
| 06-Feb | y    | y   | y   | y  | y  | y    | y    | y    | n   | y  | y   | n   | y   | y   | n     | AE25   | Hector, joint Proteus/TO   |
| 07-Feb |      |     |     |    |    |      |      |      |     |    |     |     |     |     |       |        |  |
| 08-Feb | y    | y   | y   | y  | y  | y    | y    | y    | y   | y  | y   | x   | x   | n   | n     | AE26   | Hector, joint Proteus/TO   |
| 09-Feb |      |     |     |    |    |      |      |      |     |    |     |     |     |     |       |        |  |
| 10-Feb | y    | y   | y   | y  | y  | y    | x    | y    | n   | y  | y   | p   | y   | n   | n     | AE27   | loss of att. control for last 30 min; 2.5 hr NOx data, TDL inlet taped |
| 11-Feb |      |     |     |    |    |      |      |      |     |    |     |     |     |     |       |        |  |
| 12-Feb | y    | y   | y   | y  | y  | y    | y    | y    | n   | y  | y   | n   | y   | y   | n     | AE28   | Aborted due to engine deicing failure. Flew round anvil at 35000'      |
| 13-Feb | y    | y   | y   | y  | p  | y    | y    | y    | n   | y  | y   | n   | y   | y   | n     | AE29   | Flight through anvil W of Coburg                                       |
| 14-Feb | y    | y   | n   | p  | y  | y    | y    | y    | y   | y  | y   | n   | y   | y   | n     | AE30i  | Intercomparison, N and W of Melville                                   |
| 15-Feb | y    | y   | y   | y  |    |      | y    | y    | n   | y  | y   | n   | y   | y   | n     | TE31   | Calibration of wind sensors  |
|        |      |     |     |    |    |      |      |      |     |    |     |     |     |     |       |        |  |
| 18-Feb | n    | n   | n   | n  | n  | n    |      |      | n   |    |     | n   | n   | n   | n     | SE032  | Transit flight back to Adelaide  |



| Meteorological summary |   |
|------------------------|---|
| 14-Jan                 | Monsoon trough extends from Gulf of C to JB Gulf. Deep W monsoon over Darwin, frequent showers  |
| 15-Jan                 | Strengthening NW winds with embedded showers and storms   |
| 16-Jan                 | Almost non-stop rain all day as the monsoon reaches its peak. Winds at 700 mb 30-35 kt  |
| 17-Jan                 | Very wet in the morning but rain ceased in the afternoon. Monsoon trough to the S is breaking up.   |
| 18-Jan                 | Monsoon trough developing into a low over WA. Focus of convection moves south   |
| 19-Jan                 | Low over WA has developed into TC Darryl. Squall lines to the S, quieter to the N of Darwin   |
| 20-Jan                 | Darryl now cat 2 but monsoon trough remains S of us. Squall lines progressing northwards during the day - AE17/AD14                       |
| 21-Jan                 | Monsoon weakening   |
| 22-Jan                 | Easterly steering over Darwin. Squall line in the evening from the east   |
| 23-Jan                 | Low cloud at airport following passage of squall line. Cleared in the afternoon   |
| 24-Jan                 | Huge squall line went over during the night, turning into an MCS over the sea. Vast anvil stretching to Timor and stratiform rain all day |
| 25-Jan                 | Benign conditions today despite deep WNW flow. Small inversion at 600 mb restricting showers. No ci anvils                                |
| 26-Jan                 | All the weather to the south today, with arcs of convection coming up to Darwin. The main monsoon low continues to move southward         |
| 27-Jan                 | Low over central NT. Strong westerly flow producing showers over land near Darwin, reaching ~ 8 km. Deep convection over central NT       |
| 28-Jan                 | As yesterday, though with fewer and shallower showers. Very suppressed to the north.  |
| 29-Jan                 | As yesterday  |
| 30-Jan                 | Monsoon low moving away to WA, so winds over us abating. A few showers.   |
| 31-Jan                 | Low still moving slowly to WA. Fairly showery over Darwin, especially inland  |
| 01-Feb                 | Less showery than yesterday   |
| 02-Feb                 | Showers pretty well gone, except for the Tiwi Islands   |
| 03-Feb                 | Clear blue skies, winds abated, isolated showers over Tiwis   |
| 04-Feb                 | Moving to full break conditions as winds abate. Very dry air in mid-levels  |
| 05-Feb                 | As yesterday though with some moistening of mid-levels south of Darwin and isolated storms  |
| 06-Feb                 | Hector developed over North-East and central Melville. Squall line developed S of Darwin in shallow trough moving N                       |
| 07-Feb                 | Deep convection all around Darwin with strong Hectors at 2.00 and 5.00  |
| 08-Feb                 | Suppressed all day until a huge Hector went off over Melville at 5.00   |
| 09-Feb                 | Very convective day all over the Darwin area. Massive Hectors, up to 20 km  |
| 10-Feb                 | Huge Hector formed over Melville, and a squall line developed to the east of Darwin   |
| 11-Feb                 | Big squall line in morning; large Hector developed over Melville late in the day  |
| 12-Feb                 | Big squall line in morning; convection developed later in the day   |
| 13-Feb                 | Big squall line in morning but convection developed over Coburg and Tiwis late in the day   |
| 14-Feb                 | Clear in the morning. Huge Hector and storms on sea breeze front E of Darwin drifting over airport  |
| 15-Feb                 | As yesterday  |