

## FLIGHT SUMMARY REPORT

**Flight Number:** 10-915

**Calendar/Julian Date:** 6 May 2010 (126)

**Sensor Package:** Cirrus Digital Camera System (DCS)  
Airborne Visible and Infrared Imaging Spectrometer (AVIRIS)

**Area(s) Covered:** Gulf Coast Oil Spill

**Investigator(s):** Leifer (UCSB) **Aircraft:** ER-2 #809

### SENSOR DATA

|                       |                                  |        |
|-----------------------|----------------------------------|--------|
| <b>Accession #:</b>   | 05948                            | _____  |
| <b>Sensor ID #:</b>   | 165                              | 099    |
| <b>Sensor Type:</b>   | DCS                              | AVIRIS |
| <b>Focal Length:</b>  | 50mm                             | _____  |
| <b>Film Type:</b>     | _____                            | _____  |
| <b>Filtration:</b>    | BW420+IR                         | _____  |
| <b>Spectral Band:</b> | 420-990nm                        | _____  |
| <b>f-Stop:</b>        | 11                               | _____  |
| <b>Shutter Speed:</b> | 1/500                            | _____  |
| <b># of Frames:</b>   | 466                              | _____  |
| <b>% Overlap:</b>     | 60%                              | _____  |
| <b>Quality:</b>       | Poor                             |        |
| <b>Remarks:</b>       | Incorrect filter, and soft focus |        |

## **NASA Suborbital Science Program**

The National Aeronautics and Space Administration maintains a variety of aircraft and sensor systems dedicated to the support of remote sensing research. Two Lockheed ER-2s (S-model U-2); two WB-57 high altitude aircraft; a DC-8; a Lockheed Orion P-3B; and the Altair unmanned aerial vehicle (supported by General Atomics) provide multi-level platforms for both NASA and investigator-owned sensors. Data are collected for the atmospheric, land, and ocean processes in support of the NASA Earth Science program, as well as for universities and other government agencies.

Additionally contracted aircraft from Department of Energy, and Twin Otter International provide remote sensing platforms for the program.

The NASA aircraft, located at Dryden Flight Research Center and Johnson Space Center, are used as test-beds for advanced sensor design and satellite simulation, as well as to support scientific and operational data collection campaigns. Numerous sensor systems are in use and under development by NASA, including multispectral imaging devices, a SAR system, and a suite of large-format metric cameras. All instruments are spectrally, spatially, and radiometrically calibrated on a routine basis. The aircraft themselves are equipped with navigation systems that continuously record GPS location and platform attitude data.

## **Airborne Visible and Infrared Imaging Spectrometer**

The Airborne Visible and Infrared Imaging Spectrometer (AVIRIS) is the second in the series of imaging spectrometer instruments developed at the Jet Propulsion Laboratory (JPL) for earth remote sensing. This instrument uses scanning optics and four spectrometers to image a 614-pixel swath simultaneously in 224 contiguous spectral bands (0.4-2.4  $\mu\text{m}$ ).

AVIRIS parameters are as follows:

|                           |  |
|---------------------------|--|
| IFOV:                     | 1 mrad                                   |
| Ground Resolution:        | 66 feet (20 meters) at 65,000 feet       |
| Total Scan Angle:         | 34°                                      |
| Swath Width:              | 5.9 nautical mile (11 km) at 65,000 feet |
| Spectral Coverage:        | 0.41-2.45 $\mu\text{m}$                  |
| Pixels/Scan Line:         | 677                                      |
| Number of Spectral Bands: | 224                                      |
| Digitization:             | 12-bits                                  |
| Data Rate:                | 20.4 MBPS                                |

| <u>Spectrometer</u> | <u>Wavelength<br/>Range</u> | <u>Number of<br/>Bands</u> | <u>Sampling<br/>Interval</u> |
|---------------------|-----------------------------|----------------------------|------------------------------|
| 1                   | 0.41 - 0.70 $\mu\text{m}$   | 31                         | 9.4 nm                       |
| 2                   | 0.68 - 1.27 $\mu\text{m}$   | 63                         | 9.4 nm                       |
| 3                   | 1.25 - 1.86 $\mu\text{m}$   | 63                         | 9.7 nm                       |
| 4                   | 1.84 - 2.45 $\mu\text{m}$   | 63                         | 9.7 nm                       |

All AVIRIS data is processed and archived at JPL. For further information contact Rob Green at Jet Propulsion Laboratory, 4800 Oak Grove Drive, Mail Stop 183-501, Pasadena, California 91109-8099. <http://aviris.jpl.nasa.gov/>

### **Cirrus Digital Camera System (DCS)**

Cirrus Digital Systems provides the digital camera. It consists of a Hasselblad camera body with a Kodak camera back and CCD array. It can be configured to acquire either false color infrared or natural color imagery.

| <b>Lens</b> | <b>Array Size</b>    | <b>Array Width</b> | <b>Field of View (FOV)</b> | <b>Altitude (feet)</b> | <b>Ground Coverage</b> | <b>Nominal Resolution</b> |
|-------------|----------------------|--------------------|----------------------------|------------------------|------------------------|---------------------------|
| 50mm        | 4072 x 4072 (pixels) | 36.72mm            | 40.3°                      | 65000                  | 7.9nm                  | 3.5m                      |
| 50mm        | 4072 x 4072 (pixels) | 36.72mm            | 40.3°                      | 45000                  | 5.4nm                  | 2.5m                      |
| 50mm        | 4072 x 4072 (pixels) | 36.72mm            | 40.3°                      | 28000                  | 3.4nm                  | 1.5m                      |

Note: Nominal resolution references the smallest target that can be imaged.

### **Airborne Sensor Facility**

The Airborne Sensor Facility at NASA Ames Research Center web site:

<http://asapdata.arc.nasa.gov/>

Additional information regarding flight documentation to include archive searches may be obtained from the following:

Airborne Sensor Facility  
MS 244-15  
NASA Ames Research Center  
Moffett Field, CA 94035  
Telephone: (650)604-6252 (FAX 4987)

# CAMERA FLIGHT LINE DATA

## FLIGHT NO. 10-915

Accession # 05948

Sensor # 165

| Check Points | Frame Numbers | Time (GMT-hr, min, sec) |          | Altitude, MSL<br>feet/meters | Heading / LineID |
|--------------|---------------|-------------------------|----------|------------------------------|------------------|
|              |               | START                   | END      |                              |                  |
| A - B        | 3089-3098     | 16:27:20                | 16:31:18 | 63700/19420                  | 86° / GC1-d1     |
| B - C        | 3099-3112     | 16:33:14                | 16:38:58 | 64000/19510                  | 114° / GC2-d2    |
| C - D        | 3113-3128     | 16:45:38                | 16:52:14 | 63500/19360                  | 85° / GC3-d1     |
| D - E        | 3129-3147     | 16:57:50                | 17:05:46 | 63800/19450                  | 132° / GC4-d1    |
| E - F        | 3148-3163     | 17:10:29                | 17:17:05 | 63700/19420                  | 89° / GC5-d1     |
| G - H        | 3164-3177     | 17:22:56                | 17:28:39 | 64200/19570                  | 54° / GC6-d1     |
| I - J        | 3178-3203     | 17:34:25                | 17:45:25 | 64400/19630                  | 300° / GC7-d1    |
| F - K        | 3204-3231     | 17:53:11                | 18:05:03 | 63700/19420                  | 44° / GC8-d1     |
| L - M        | 3232-3286     | 18:16:12                | 18:39:56 | 28200/8600                   | 198° / OS-N1-d1  |
| N - O        | 3287-3323     | 18:51:33                | 19:07:22 | 28000/8540                   | 278° / OS-W1-d1  |
| P - Q        | 3324-3395     | 19:13:28                | 19:44:39 | 28000/8540                   | 357° / OS-N0-d1  |

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| Check<br>Points | Frame<br>Numbers | Time (GMT-hr, min, sec) |          | Altitude, MSL<br>feet/meters | Heading / Line ID |
|-----------------|------------------|-------------------------|----------|------------------------------|-------------------|
|                 |                  | START                   | END      |                              |                   |
| R - S           | 3396-3448        | 19:47:38                | 20:10:28 | 28000/8540                   | 199° / OS-N1-d1   |
| T - U           | 3449-3470        | 20:31:06                | 20:40:19 | 62300/18990                  | 303° / GC11-d1    |
| V - W           | 3471-3485        | 20:44:02                | 20:50:12 | 65100/19850                  | 54° / GC10-d1     |
| W - X           | 3486-3517        | 20:59:11                | 21:12:49 | 63200/19270                  | 97° / GC12-d1     |
| X - Y           | 3518-3530        | 21:19:54                | 21:25:10 | 63200/19270                  | 93° / GC13-d1     |
| X - Z           | 3531-3554        | 21:35:46                | 21:45:52 | 63800/19450                  | 268° / GC12B-d1   |





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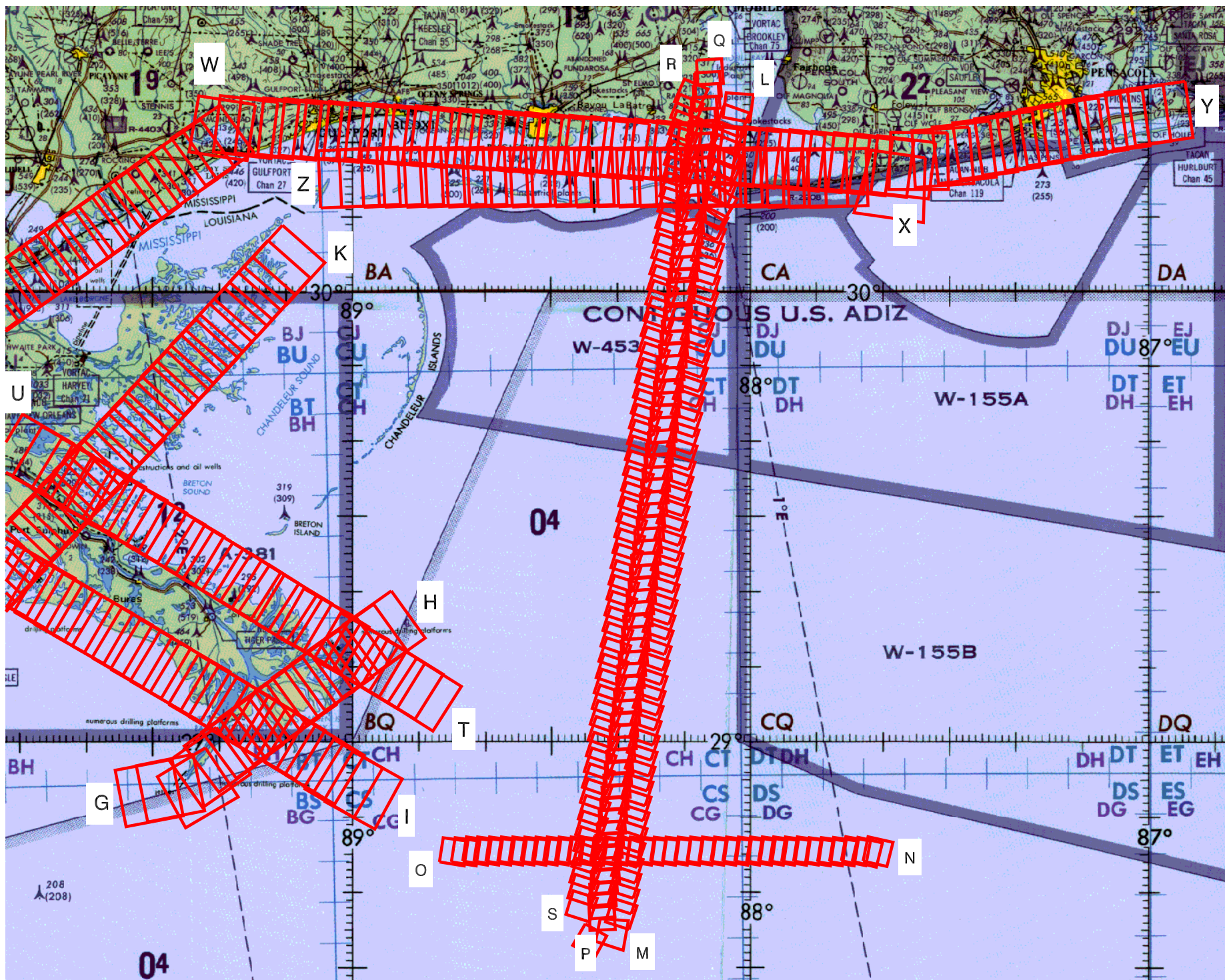
A/C 809 (ER-2)

DCS









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DCS