

FLIGHT SUMMARY REPORT

Flight Number: 99-069
Calendar/Julian Date: 13 May 1999 • 133
Sensor Package: Airborne Visible and Infrared Imaging Spectrometer(AVIRIS)
Modis Airborne Simulator (MAS)

Area(s) Covered: Ferry – DFRC to Patrick AFB

Investigator(s): NASA ARC

Aircraft #: 809

SENSOR DATA

Accession #:	----	----
Sensor ID #:	099	108
Sensor Type:	AVIRIS	MAS 50
Focal Length:	----	----
Film Type:	----	----
Filtration:	----	----
Spectral Band:	----	----
f Stop:	----	----
Shutter Speed:	----	----
# of Frames:	----	----
% Overlap:	----	----
Quality:	----	----
Remarks:		

Airborne Science and Applications Program

The Airborne Science Program at NASA's Dryden Flight Research Center, Edwards, California, operates two ER-2 high altitude aircraft in support of NASA earth science research. The ER-2s are used as readily deployable high altitude sensor platforms to collect remote sensing and in situ data on earth resources, celestial phenomena, atmospheric dynamics, and oceanic processes. Additionally, these aircraft are used for electronic sensor research and development and satellite investigative support.

The ER-2s are flown from various deployment sites in support of scientific research sponsored by NASA and other federal, state, university, and industry investigators. Data are collected from deployment sites in Kansas, Texas, Virginia, Florida, and Alaska. Cooperative international scientific projects have deployed the aircraft to sites in Great Britain, Australia, Chile, and Norway.

Photographic and digital imaging sensors are flown aboard the ER-2s in support of research objectives defined by the sponsoring investigators. High resolution mapping cameras and digital multispectral imaging sensors are utilized in a variety of configurations in the ER-2s' four pressurized experiment compartments. The following provides a description of the digital multispectral sensor(s) and camera(s) used for data collection during this flight.

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 μm).

AVIRIS parameters are as follows:

IFOV:	1 mrad
Ground Resolution:	66 feet (20 meters) at 65,000 feet
Total Scan Angle:	30 ^o
Swath Width:	5.7 nmi (10.6 km) at 65,000 feet
Spectral Coverage:	0.41-2.45 μm
Pixels/Scan Line:	614
Number of Spectral Bands:	224
Digitization:	10-bits
Data Rate:	17 MBPS

<u>Spectrometer</u>	<u>Wavelength Range</u>	<u>Number of Bands</u>	<u>Sampling Interval</u>
1	0.41 - 0.70 μm	31	9.4 nm
2	0.68 - 1.27 μm	63	9.4 nm
3	1.25 - 1.86 μm	63	9.7 nm
4	1.84 - 2.45 μm	63	9.7 nm

All AVIRIS data is decommutated and archived at JPL and not currently available for public distribution. For further information contact Rob Green at Jet Propulsion Laboratory, 4800 Oak Grove Drive, Mail Stop 183-501, Pasadena, California 91109-8099.

MODIS Airborne Simulator

The MODIS Airborne Simulator (MAS) is a modified Daedalus multispectral scanner configured to replicate the capabilities of the Moderate-Resolution Imaging Spectrometer (MODIS), an instrument to be orbited on an

EOS platform. MODIS is designed for the measurement of biological and physical processes and atmospheric temperature sounding. The MODIS Airborne Simulator records fifty 16-bit channels of multispectral data and is configured as follows:

Spectral Channel	Band center (µm)	Bandwidth (µm)	Spectral Range
1	0.4649	0.0397	0.4451-0.4848
2	0.5494	0.0417	0.5285-0.5703
3	0.6550	0.0511	0.6294-0.6805
4	0.7024	0.0415	0.6816-0.7231
5	0.7431	0.0420	0.7221-0.7641
6	0.8248	0.0427	0.8034-0.8461
7	0.8667	0.0414	0.8460-0.8874
8	0.9072	0.0409	0.8867-0.9276
9	0.9476	0.0397	0.9277-0.9674
10	1.6422	0.0519	1.6163-1.6682
11	1.6975	0.0505	1.6722-1.7228
12	1.7499	0.0506	1.7245-1.7752
13	1.8014	0.0491	1.7768-1.8259
14	1.8548	0.0489	1.8303-1.8792
15	1.9044	0.0487	1.8801-1.9288
16	1.9553	0.0483	1.9312-1.9794
17	2.0048	0.0487	1.9804-2.0291
18	2.0551	0.0484	2.0309-2.0793
19	2.1037	0.0486	2.0794-2.1280
20	2.1532	0.0483	2.1291-2.1774
21	2.2019	0.0481	2.1779-2.2259
22	2.2522	0.0486	2.2278-2.2675
23	2.3021	0.0487	2.2777-2.3265
24	2.3512	0.0476	2.3274-2.3750
25	2.4005	0.0483	2.3764-2.4246

Spectral Channel	Band center (µm)	Bandwidth (µm)	Spectral Range
26	3.1192	0.1616	3.0384-3.2000
27	3.2809	0.1486	3.2066-3.3552
28	3.4330	0.1617	3.3521-3.5138
29	3.5940	0.1539	3.5170-3.6709
30	3.7449	0.1449	3.6724-3.8174
31	3.9069	0.1602	3.8267-3.9870
32	4.0707	0.1554	3.9929-4.1484
33	4.1699	0.0669	4.1365-4.2034
34	4.4029	0.1255	4.3401-4.4656
35	4.5404	0.1512	4.4648-4.6160
36	4.6979	0.1591	4.6184-4.7775
37	4.8536	0.1516	4.7778-4.9294
38	5.0033	0.1468	4.9298-5.0767
39	5.1588	0.1400	5.0888-5.2288
40	5.3075	0.1327	5.2412-5.3738
41	5.3977	0.0755	5.3590-5.4365
42	8.5366	0.3950	8.3391-8.7341
43	9.7224	0.5365	9.4541-9.9906
44	10.5071	0.4579	10.278-10.736
45	11.0119	0.4710	10.776-11.247
46	11.9863	0.4196	11.776-12.196
47	12.9013	0.3763	12.713-13.089
48	13.2702	0.4584	13.041-13.500
49	13.8075	0.5347	13.540-14.075
50	14.2395	0.3775	14.051-14.428

NOTE: Bandpass centers approximate

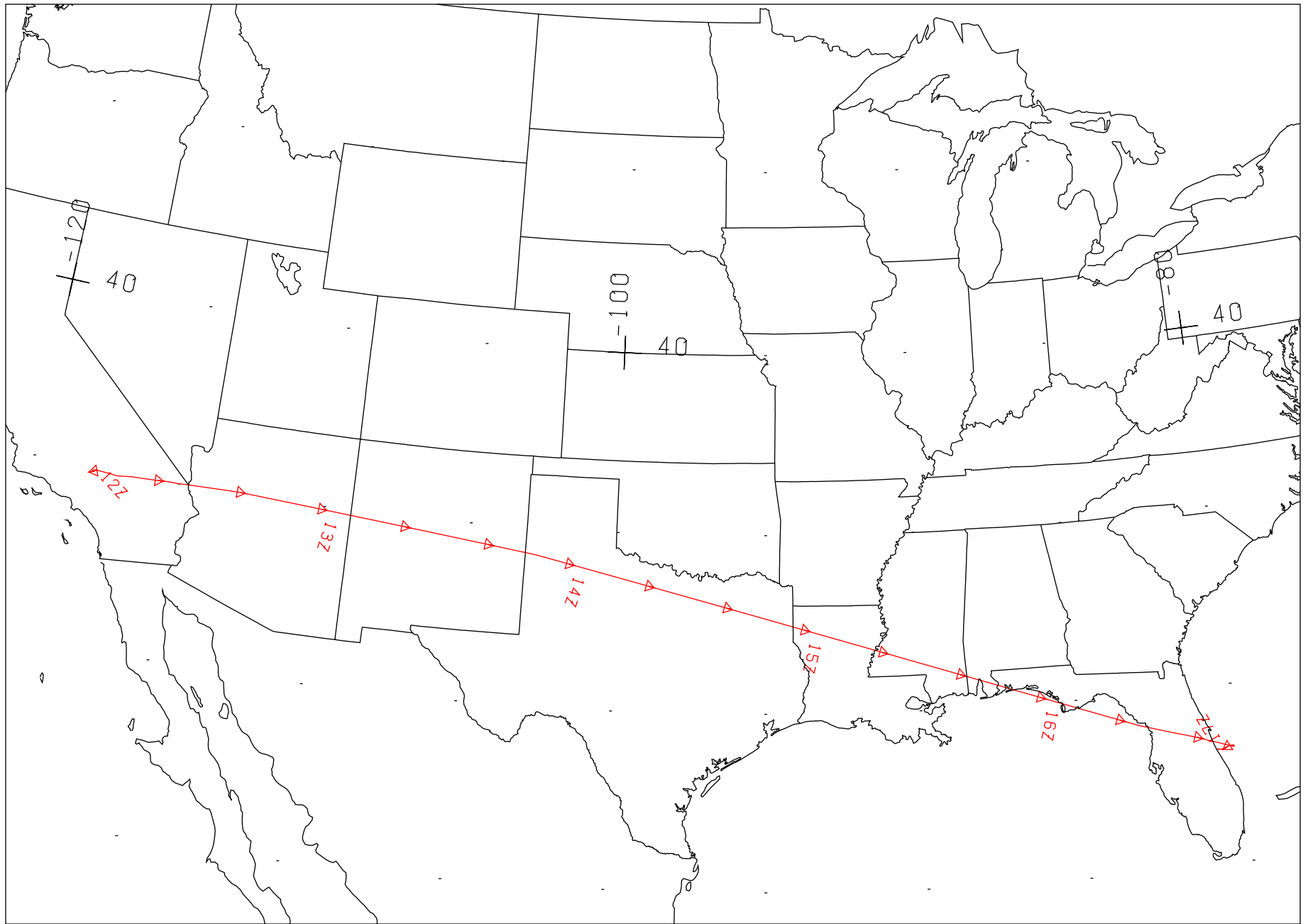
Sensor/Aircraft Parameters:

Spectral Bands: 50 (digitized to 16-bit resolution)
 IFOV: 2.5 mrad
 Ground Resolution: 163 feet (50 meter at 65,000 feet)
 Swath Width: 22.9 mi/19.9 nmi (36 km)
 Total Scan Angle: 85.92°
 Pixels/Scan Line: 716
 Scan Rate: 6.25 scans/second
 Ground Speed: 400 kts (206 m/second)
 Roll Correction: Plus or minus 3.5 degrees (approx.)

MODIS AIRBORNE SIMULATOR (MAS) FLIGHT LINE INFORMATION FOR 13-MAY-1999 FLIGHT 99-069

START OF FLIGHT LINE							END OF FLIGHT LINE					
LINE	TIME HH:MM:SS	LAT DEG	LON DEG	SOLAR ZEN AZIM		START HEADING	TIME HH:MM:SS	LAT DEG	LON DEG	SOLAR ZEN AZIM		SCAN LINES
1	12:37:40	35.060	-112.919	89.4	67.9	93.54	12:51:02	34.977	-111.039	85.4	70.8	4995
2	12:51:03	34.977	-111.038	85.4	70.9	95.91	13:04:26	34.864	-109.143	81.3	73.7	5000
3	13:04:27	34.863	-109.136	81.3	73.7	97.00	13:17:50	34.719	-107.205	77.2	76.4	5000
4	13:17:51	34.718	-107.204	77.2	76.4	98.64	13:31:14	34.542	-105.289	73.0	79.1	5000
5	13:31:15	34.541	-105.287	73.0	79.1	99.77	13:43:52	34.348	-103.487	69.0	81.6	4714
6	13:43:55	34.345	-103.482	68.9	81.6	98.93	13:49:33	34.252	-102.691	67.1	82.7	2096
7	13:49:56	34.246	-102.643	67.0	82.8	101.84	14:03:19	33.920	-100.824	62.8	85.3	5000
8	14:03:20	33.918	-100.814	62.8	85.3	104.20	14:16:42	33.564	-99.001	58.5	87.8	4995
9	14:16:43	33.565	-99.007	58.5	87.8	104.98	14:30:05	33.194	-97.252	54.3	90.3	4995
10	14:30:06	33.193	-97.248	54.3	90.3	105.84	14:43:28	32.800	-95.517	50.0	92.9	4995
11	14:43:29	32.798	-95.515	50.0	92.9	106.41	14:51:02	32.565	-94.548	47.6	94.3	2822
12	14:51:05	32.565	-94.539	47.6	94.4	107.20	15:04:27	32.134	-92.834	43.3	97.0	4996
13	15:04:28	32.134	-92.831	43.3	97.0	108.32	15:17:50	31.677	-91.126	39.0	99.9	4995
14	15:17:51	31.676	-91.123	39.0	99.9	108.62	15:31:12	31.200	-89.447	34.7	103.0	4994
15	15:31:14	31.199	-89.445	34.7	103.0	111.23	15:44:36	30.697	-87.770	30.4	106.6	4995
16	15:44:37	30.696	-87.768	30.4	106.6	111.83	15:57:56	30.159	-86.072	26.1	110.7	4977
17	15:58:00	30.154	-86.056	26.0	110.8	112.76	16:11:22	29.599	-84.390	21.8	116.0	4935
18	16:11:23	29.599	-84.393	21.8	116.0	113.87	16:21:25	29.176	-83.173	18.8	121.0	3561

NUMBER OF FILES FOR THIS FLIGHT = 18
 TOTAL NUMBER OF SCAN LINES = 83065
 DATE THESE FILES WERE PROCESSED = 17-Jun-99
 DATE THIS LIST WAS CREATED = 17-Jun-99
 GRANULE VERSION = 9



FLIGHT 99-069

13 MAY 1999

A/C 809

AVIRIS / MAS50