FLIGHT SUMMARY REPORT

Flight Number: 11-002-05

Calendar/Julian Date: 12 October 2010 (285)

Sensor Package: Cirrus Digital Camera System (DCS)
MODIS/ASTER Airborne Simulator (MASTER)

Area(s) Covered: Jornada / Sevilleta New Mexico

Investigator(s): French (USDA) **Aircraft:** DoE B200 #796

SENSOR DATA

Accession #:	05985	___
Sensor ID #:	167	124
Sensor Type:	DCS	MASTER
Focal Length:	50mm	___
Film Type:	___	___
Filtration:	Wratten 12	___
Spectral Band:	510-990nm	___
f-Stop:	11	___
Shutter Speed:	1/500	___
# of Frames:	241	___
% Overlap:	60%	___
Quality:	Excellent	Fair

Remarks:

NASA Airborne 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; Global Hawk 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 medium-format digital 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 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)

MASTER (MODIS/ASTER Airborne Simulator

The MODIS/ASTER Airborne Simulator (MASTER) is similar to MAS, with the thermal bands modified to more closely match the NASA EOS ASTER (Advanced Spaceborne Thermal Emission and Reflection Radiometer). It is intended primarily to study geologic and other Earth surface properties. It has a variable scan speed which allows data to be acquired on both high and low altitude aircraft. Its fifty spectral bands are configured below:

MASTER AIRBORNE SIMULATOR			***ASTER***		
Band	**Bandwidth**	**Resolution**	***Band***	***Bandwidth***	***Resolution***
1	0.438-0.482	5-50m			
2	0.479-0.522	5-50m			
3	0.521-0.564	5-50m	***1***	*0.520-0.600*	*15m*
4	0.562-0.603	5-50m			
5	0.633-0.692	5-50m	***2***	*0.630-0.690*	*15m*
6	0.692-0.734	5-50m			
7	0.731-0.773	5-50m		*0.760-0.860*	*15m*
8	0.781-0.823	5-50m	***3***		
9	0.848-0.889	5-50m			
10	0.886-0.927	5-50m			
11	0.927-0.966	5-50m			
12	1.582-1.636	5-50m	***4***	*1.600-1.700*	*30m*
13	1.638-1.691	5-50m			
14	1.694-1.745	5-50m			
15	1.749-1.801	5-50m			
16	1.803-1.853	5-50m			
17	1.852-1.898	5-50m			
18	1.896-1.953	5-50m			
19	1.956-2.006	5-50m			
20	2.057-2.105	5-50m			
21	2.134-2.185	5-50m	***5***	*2.145-2.185*	*30m*
22	2.185-2.236	5-50m	***6***	*2.185-2.225*	*30m*
23	2.233-2.284	5-50m	***7***	*2.235-2.285*	*30m*
24	2.294-2.363	5-50m	***8***	*2.295-2.365*	*30m*
25	2.362-2.426	5-50m	***9***	*2.360-2.430*	*30m*
26	3.075-3.231	5-50m			
27	3.231-3.377	5-50m			
28	3.385-3.535	5-50m			
29	3.538-3.694	5-50m			
30	3.692-3.826	5-50m			
31	3.846-3.999	5-50m			
32	3.999-4.154	5-50m			
33	4.157-4.310	5-50m			
34	4.307-4.460	5-50m			
35	4.456-4.603	5-50m			
36	4.597-4.760	5-50m			
37	4.753-4.911	5-50m			
38	4.906-5.054	5-50m			
39	5.044-5.205	5-50m			
40	5.203-5.342	5-50m			

Continued Next Page

MASTER AIRBORNE SIMULATOR			*ASTER*		
Band	**Bandwidth**	**Resolution**	***Band***	***Bandwidth***	***Resolution***
41	7.587-7.943	5-50m			
42	7.950-8.398	5-50m	***10***	*8.125-8.475*	*90m*
43	8.447-8.806	5-50m	***11***	*8.475-8.825*	*90m*
44	8.882-9.307	5-50m	***12***	*8.925-9.275*	*90m*
45	9.503-9.902	5-50m			
46	9.912-10.327	5-50m			
47	10.338-10.922	5-50m	***13***	*10.25-10.95*	*90m*
48	10.977-11.652	5-50m	***14***	*10.95-11.65*	*90m*
49	11.864-12.364	5-50m			
50	12.638-13.119	5-50m			

MASTER/Aircraft Parameters:

Spectral Bands:	50 (16-bit resolution)
IFOV:	2.5mrad
Swath width:	19.9nm (36km) at 65,000ft
Ground Resolution	5-50m (variable w/ altitude)
Total FOV:	85.92 degrees
Pixels/Scanline:	716
Scan Rate:	6.25 – 25 Hz
URL Reference:	http://masterweb.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.

Lens	Array Size	Array Width	Field of View (FOV)	Altitude	Ground Coverage	Nominal Resolution
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
50mm	4072 x 4072 (pixels)	36.72mm	40.3°	13000’	1.6nm	0.7m
50mm	4072 x 4072 (pixels)	36.72mm	40.3°	6500’	0.8nm	0.4m

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

CAMERA FLIGHT LINE DATA
FLIGHT NO. 11-002-05

Accession # 05985

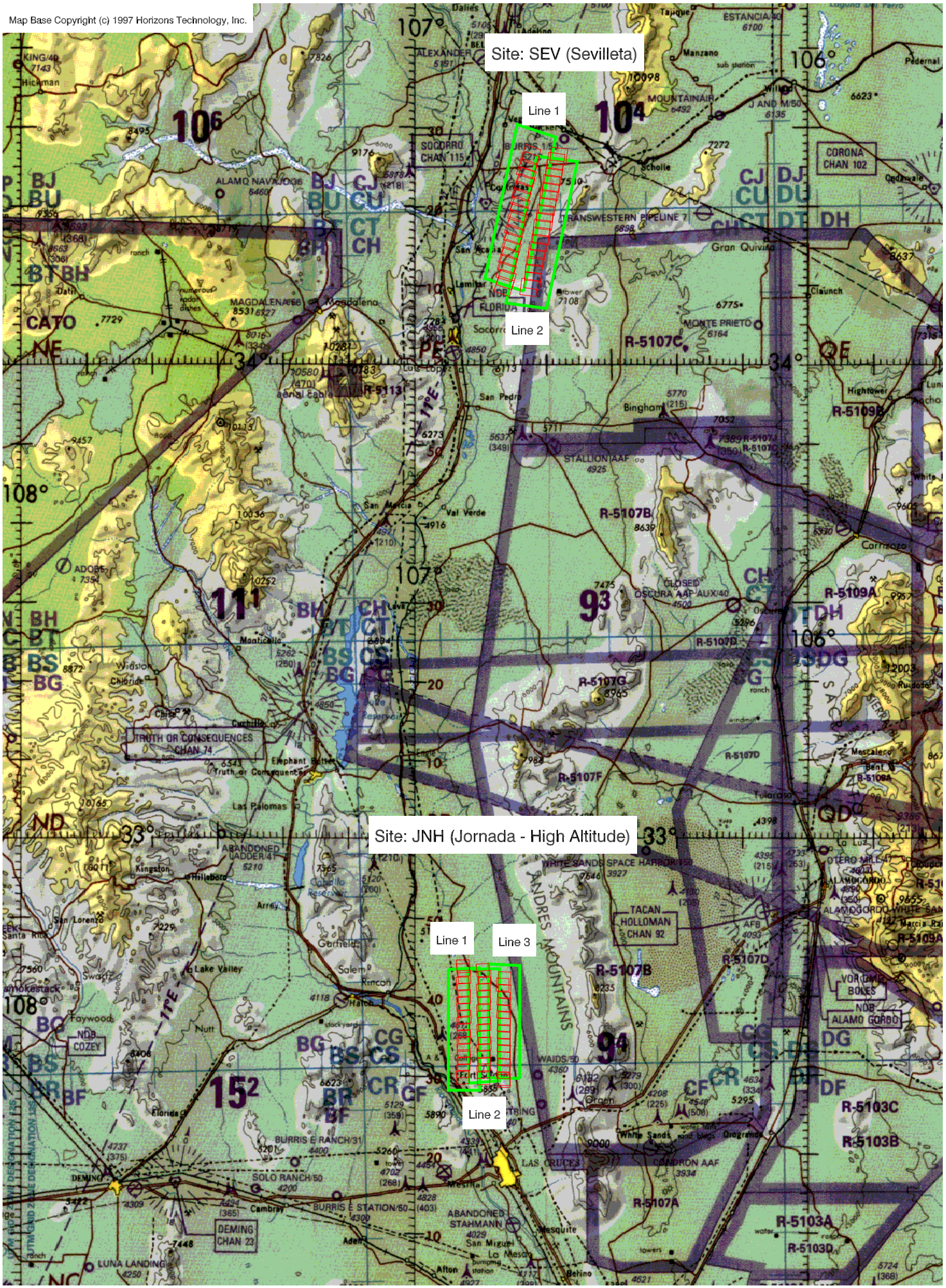
Sensor # 167

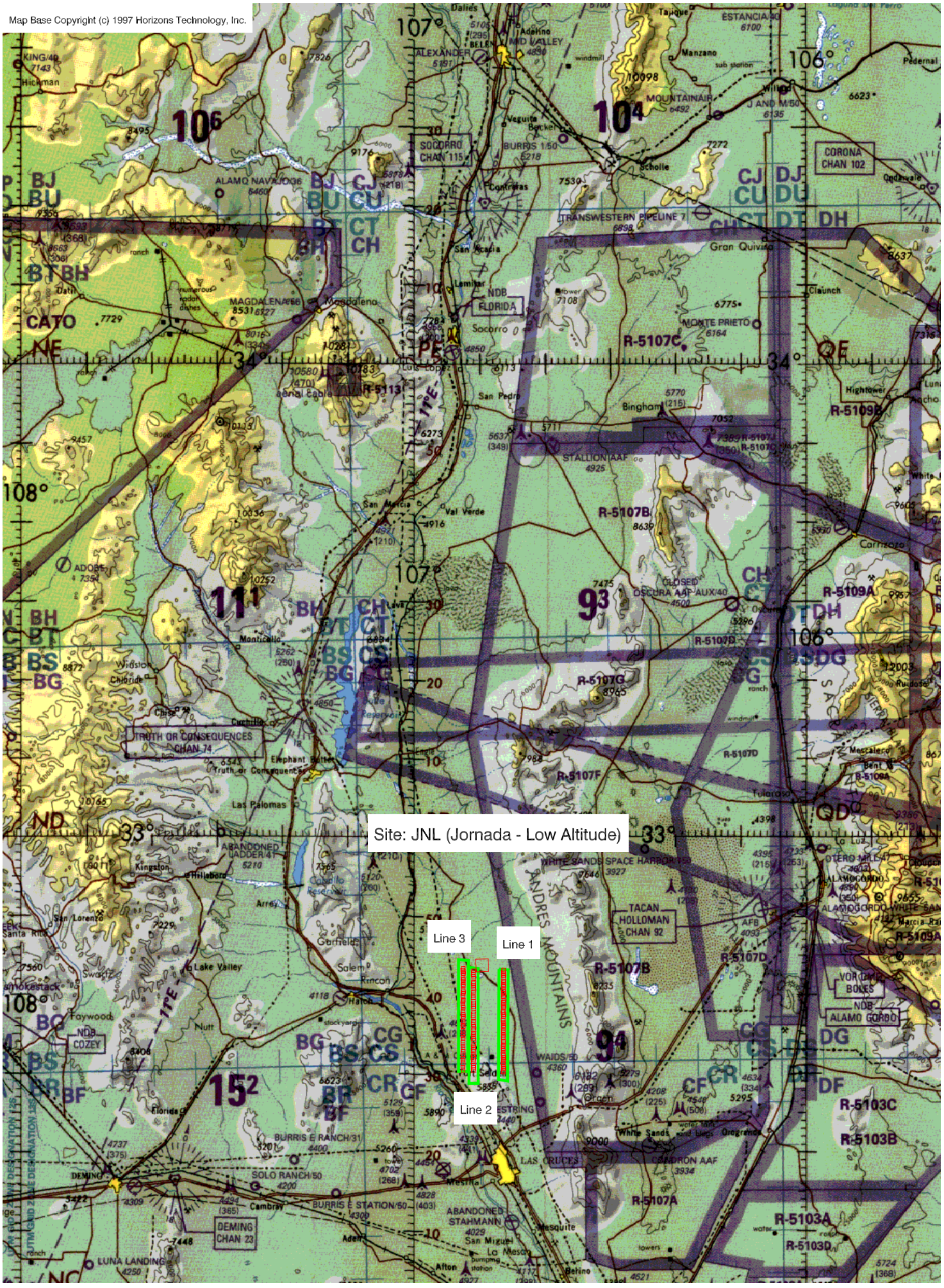
Site #	Line #	Run #	Frame #	Time (GMT-hr, min, sec) START	Time (GMT-hr, min, sec) END	Altitude, GPS feet/meters	Cloud Cover/Remarks
SEV	1	1	3503-3521	16:23:24	16:27:44	21900/6680	Clear
SEV	2	1	3522-3540	16:32:05	16:36:22	21900/6680	Clear
JNH	1	1	3541-3558	17:33:22	17:37:21	18300/5580	Clear
JNH	3	1	3559-3575	17:41:25	17:45:05	18300/5580	Clear
JNH	2	1	3576-3593	17:57:20	18:01:17	18300/5580	Clear (ASTER overpass 17:56:55)
JNL	1	1	3594-3643	18:13:04	18:18:51	9100/2780	Clear
JNL	3	1	3644-3694	18:23:53	18:29:46	9100/2780	Clear
JNL	2	1	3695-3743	18:33:36	18:39:17	9000/2750	Clear

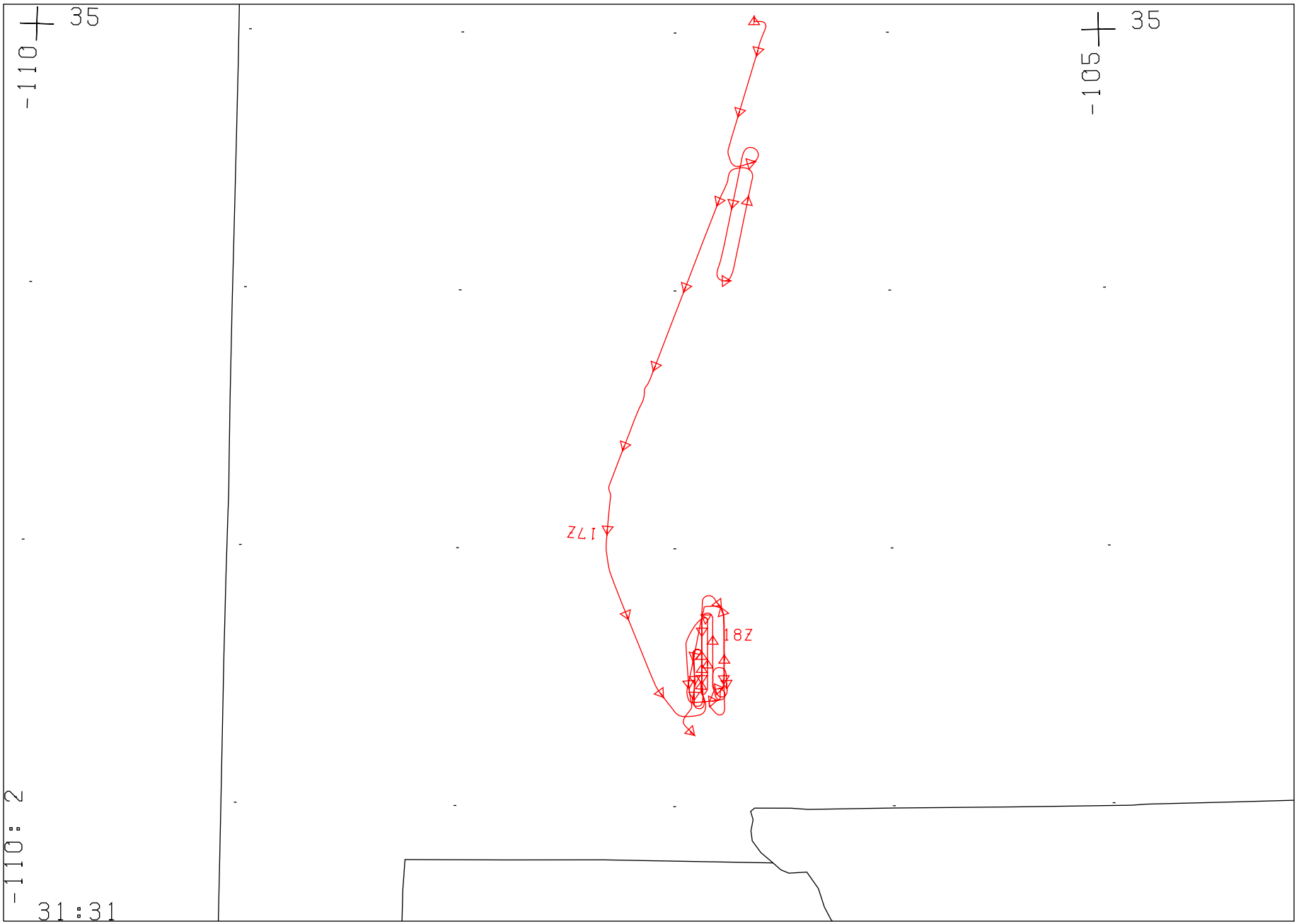
MODIS/ASTER AIRBORNE SIMULATOR (MASTER) FLIGHT LINE INFORMATION FOR 12 Oct 2010
NASA FLIGHT NUMBER 11-002-05

				START OF FLIGHT LINE			END OF FLIGHT LINE			FLIGHT DATA				
FLTL	SITE	LINE	RUN	TIME HH:MM:SS	LAT DEG	LON DEG	TIME HH:MM:SS	LAT DEG	LON DEG	SCAN LINES	SOLAR ZEN	SOLAR AZIM	HEAD DEG	ALT M (MSL)
1	SEV	01	1	16:22:37	34.491	-106.686	16:27:45	34.164	-106.768	3827	54.4	132.8	199.44	6678
2	SEV	02	1	16:31:32	34.122	-106.711	16:36:20	34.433	-106.633	3574	53.0	135.0	8.29	6685
3	JN1	01	1	17:32:54	32.464	-106.870	17:37:18	32.723	-106.871	3289	44.1	151.4	359.50	5565
4	JN1	03	1	17:40:55	32.732	-106.769	17:45:02	32.490	-106.769	3066	43.3	154.2	182.82	5566
5	JN1	02	1	17:57:13	32.481	-106.819	18:01:17	32.723	-106.820	3035	42.0	159.7	357.29	5564
6	JN2	01	1	18:12:36	32.482	-106.769	18:18:55	32.717	-106.767	9443	41.0	165.8	7.48	2762
7	JN2	03	1	18:23:22	32.737	-106.869	18:29:50	32.499	-106.870	9680	40.5	169.7	182.50	2759
8	JN2	02	1	18:32:54	32.476	-106.844	18:39:29	32.720	-106.843	9818	40.2	173.4	3.47	2758

NUMBER OF FILES FOR THIS FLIGHT = 8
TOTAL NUMBER OF SCAN LINES = 45732
DATE THESE FILES WERE PROCESSED = 18-Nov-2010
DATE THIS LIST WAS CREATED = Mon Nov 22 13:26:27 PST 2010
GRANULE VERSION = 1


Map Base Copyright (c) 1997 Horizons Technology, Inc.
Site: SEV (Sevilleta)
Line 1
Line 2
Site: JNH (Jornada - High Altitude)
Line 1
Line 3
Line 2
DCS
MASTER
DoE B200
12 October 2010
Flight 11-002-05


Map Base Copyright (c) 1997 Horizons Technology, Inc.
Site: JNL (Jornada - Low Altitude)
Line 3
Line 1
Line 2
DCS
MASTER
DoE B200
12 October 2010
Flight 11-002-05



FLIGHT 11-002-05 12 OCTOBER 2010 A/C 796 (DOE B200 ROMEO) MASTER / DCS

LAMBERT CONFORMAL PROJECTION: SP1 = 31.8 SP2 = 34.6 CM = -106.9 ROTATED BY 0.0

16:05:00 TO 18:52:00 UT SCALE 1:2.30E+06 TIME TICK EVERY 5.00 MINUTES