FLIGHT SUMMARY REPORT

Flight Number: 98-008-01

Calendar/Julian Date: 13 August 1998 • 225

Sensor Package: Wild Heerbrugg RC-30
MODIS/MASTER Airborne Simulator (MASTER)

Area(s) Covered: Lake Mead and Ivanpah, NV

Investigator(s): Hook, JPL

Aircraft #: 798
Department of Energy
Kingair B200

SENSOR DATA

Accession #:	05296	-----
Sensor ID #:	126	124
Sensor Type:	RC-30	MASTER
Focal Length:	6” 153.21 mm	-----
Film Type:	Aerochrome IR SO-134	-----
Filtration:	Wratten 12 + 2.2 AV	-----
Spectral Band:	510-900 nm	-----
f Stop:	4	-----
Film Speed:	80	-----
# of Frames:	73	-----
% Overlap:	60	-----
Quality:	Fair	-----

Remarks:

Airborne Science 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.

Department of Energy Remote Sensing Laboratory

The NASA Airborne Science Program at Dryden Flight Research Center and Ames Research Center contracted with the Department of Energy Remote Sensing Laboratory (RSL) in Las Vegas, Nevada to acquire remote sensing data with the DOE King Air B-200 aircraft.

The DOE King Air B-200 is a low and medium altitude, moderate speed aircraft. It can operate from 4,000 to 35,000 feet above sea level at speeds between 135 and 225 knots. There are two instrument ports in the aircraft. The NASA MASTER Scanner was mounted over the forward port and the DOE Wild Heerbrugg RC-30 Mapping Camera was mounted over the aft port.

Camera Systems

Various camera systems and films are used for photographic data collection. Film types include high definition color infrared, natural color, and black and white emulsions. Available photographic systems are as follows:

- Wild-Heerbrugg RC-10/RC-30 metric mapping camera
  - 9 x 9 inch film format
  - 6 inch focal length lens provides area coverage of 16 x 16 nautical miles from 65,000 feet
  - 12 inch focal length lens provides area coverage of 8 x 8 nautical miles from 65,000 feet

- Hycon HR-732 large scale mapping camera
  - 9 x 18 inch film format
  - 24 inch focal length lens provides area coverage of 4 x 8 nautical miles from 65,000 feet

- IRIS II Panoramic camera
  - 4.5 x 34.7 inch film format
  - 24 inch focal length lens
  - 90 degree field of view provides area coverage of 2 x 21.4 nautical miles from 65,000 feet

MASTER (MODIS/ASTER Airborne Simulator)

The MASTER is similar to the MAS, with the thermal bands modified to more closely match the NASA EOS ASTER (Advanced Spaceborne Thermal Emission and Reflection Radiometer) satellite instrument, which is scheduled for launch in 1998. It is intended primarily to study geologic and other Earth surface properties. Flying on both high and low altitude aircraft, the MASTER became operational in early 1998. Its fifty spectral bands are configured as follows:

Spectral Channel	Band center (µm)	Bandwidth (µm)	Spectral Range
1	0.460	0.04	0.440-0.480
2	0.500	0.04	0.480-0.520
3	0.540	0.04	0.520-0.560
4	0.580	0.04	0.560-0.600
5	0.660	0.06	0.630-0.690
6	0.710	0.04	0.690-0.730
7	0.750	0.04	0.730-0.770
8	0.800	0.04	0.780-0.820
9	0.865	0.04	0.845-0.885
10	0.905	0.04	0.885-0.925
11	0.945	0.04	0.925-0.965
12	1.625	0.05	1.600-1.650
13	1.675	0.05	1.650-1.700
14	1.725	0.05	1.700-1.750
15	1.775	0.05	1.750-1.800
16	1.825	0.05	1.800-1.850
17	1.875	0.05	1.850-1.900
18	1.925	0.05	1.900-1.950
19	1.975	0.05	1.950-2.000
20	2.075	0.05	2.050-2.100
21	2.160	0.05	2.135-2.185
22	2.210	0.05	2.185-2.235
23	2.260	0.05	2.235-2.285
24	2.3295	0.065	2.297-2.362
25	2.3945	0.065	2.362-2.427

Spectral Channel	Band center (µm)	Bandwidth (µm)	Spectral Range
26	3.150	0.15	3.075-3.225
27	3.300	0.15	3.225-3.375
28	3.3450	0.15	3.375-3.525
29	3.600	0.15	3.525-3.675
30	3.750	0.15	3.675-3.825
31	3.900	0.15	3.825-3.975
32	4.050	0.15	3.975-4.125
33	4.200	0.15	4.125-4.275
34	4.575	0.6	4.275-4.875
35	4.500	0.15	4.425-4.575
36	4.650	0.15	4.575-4.725
37	4.800	0.15	4.725-4.875
38	4.950	0.15	4.875-5.025
39	5.100	0.15	5.025-5.175
40	5.250	0.15	5.175-5.325
41	7.900	0.4	7.70-8.10
42	8.300	0.4	8.10-8.50
43	8.700	0.4	8.50-8.90
44	9.100	0.4	8.90-9.30
45	9.700	0.4	9.50-9.90
46	10.100	0.4	9.90-10.30
47	10.625	0.65	10.30-10.95
48	11.300	0.7	10.95-11.65
49	12.050	0.5	11.80-12.30
50	12.750	0.5	12.50-13.00

Sensor/Aircraft Parameters:

Spectral Bands:	50 (16-bit resolution)
IFOV:	2.5 mrad
Swath width:	19.9 nmi (36 km) at 65,000 ft
Ground Resolution:	12-50 meters (variable w/ altitude)
Total FOV:	85.92 degrees

Pixels/Scanline:	716
Scan Rate:	6.25 - 25 Hz

(See the homepage at asterweb.jpl.nasa.gov)

Information on data tape format, logical record format, and scanner calibration data may be obtained from the Aircraft Data Facility, NASA-Ames Research Center, Mail Stop 240-6, Moffett Field, California 94035-1000 (Telephone: 650-604-6252).

Data Availability

The U.S. Geological Survey's EROS Data Center at Sioux Falls, South Dakota serves as the archive and product distribution facility for Airborne Science Program aircraft acquired photographic and digital imagery. The photographic archive consists of photography acquired by the program from 1971 to April 1996. For information regarding photography and digital data (including areas of coverage, products, and product costs) contact EROS Data Center, Customer Services, Sioux Falls, South Dakota 57198 (Telephone: 605-594-6151).

As of April 1996 the EROS Data Center no longer receives an archive copy of newly acquired Airborne Science Program photography. Original photography is archived with the Airborne Sensor Facility at Ames Research Center. A user copy of the photography is provided to the principal investigators for each flight. Principal investigators are cited on the first page of their respective flight summary reports. For information regarding photography acquired from April 1996 to the present contact the Airborne Sensor Facility as follows:

Flight Documentation and Data Archive Searches

The following is the web site for flight documentation as published by the Airborne Sensor Facility at NASA Ames Research Center:

http://asapdata.arc.nasa.gov/er-2fsr.html

Additional information regarding flight documentation to include data archive searches, data availability, sensor parameters, and areas of coverage may be obtained from the following:

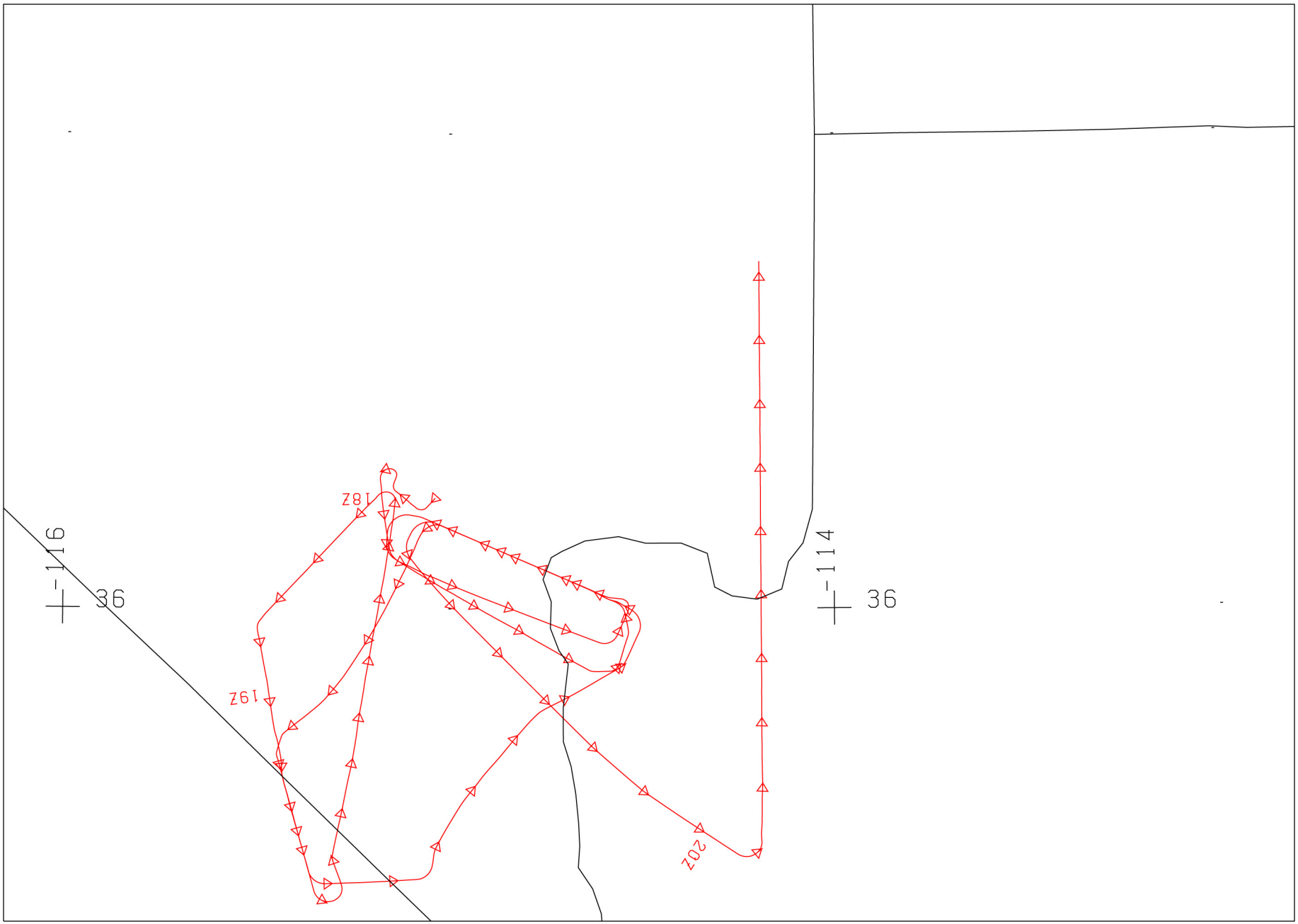
Airborne Sensor Facility
MS 240-6
NASA Ames Research Center
Moffett Field, CA 94035-1000
Telephone: (650)604-6252 (FAX 4987)

CAMERA FLIGHT LINE DATA
FLIGHT NO. 98-008-01

Accession # 05296

Sensor # 126

Site #	Line #	Run #	Frame #	Time (GMT-hr, min, sec) START	Time (GMT-hr, min, sec) END	Altitude, MGL feet/meters	Cloud Cover/Remarks
856	1	1	0001-0020	18:30:00	18:32:43	7590/2313	Clear
857	1	1	0021-0024	18:48:12	18:48:36	15800/4816	Clear
857	2	1	0025-0029	18:53:22	18:53:48	15800/4816	Clear
856	1	2	0030-0036	19:03:11	19:05:10	21371/6514	Clear
810	1	3	0037-0045	19:42:01	19:46:25	29811/9086	Clear
810	2	1	0046-0073	20:04:02	20:20:13	29696/9051	Minor cumulus (frames 0046-0050)



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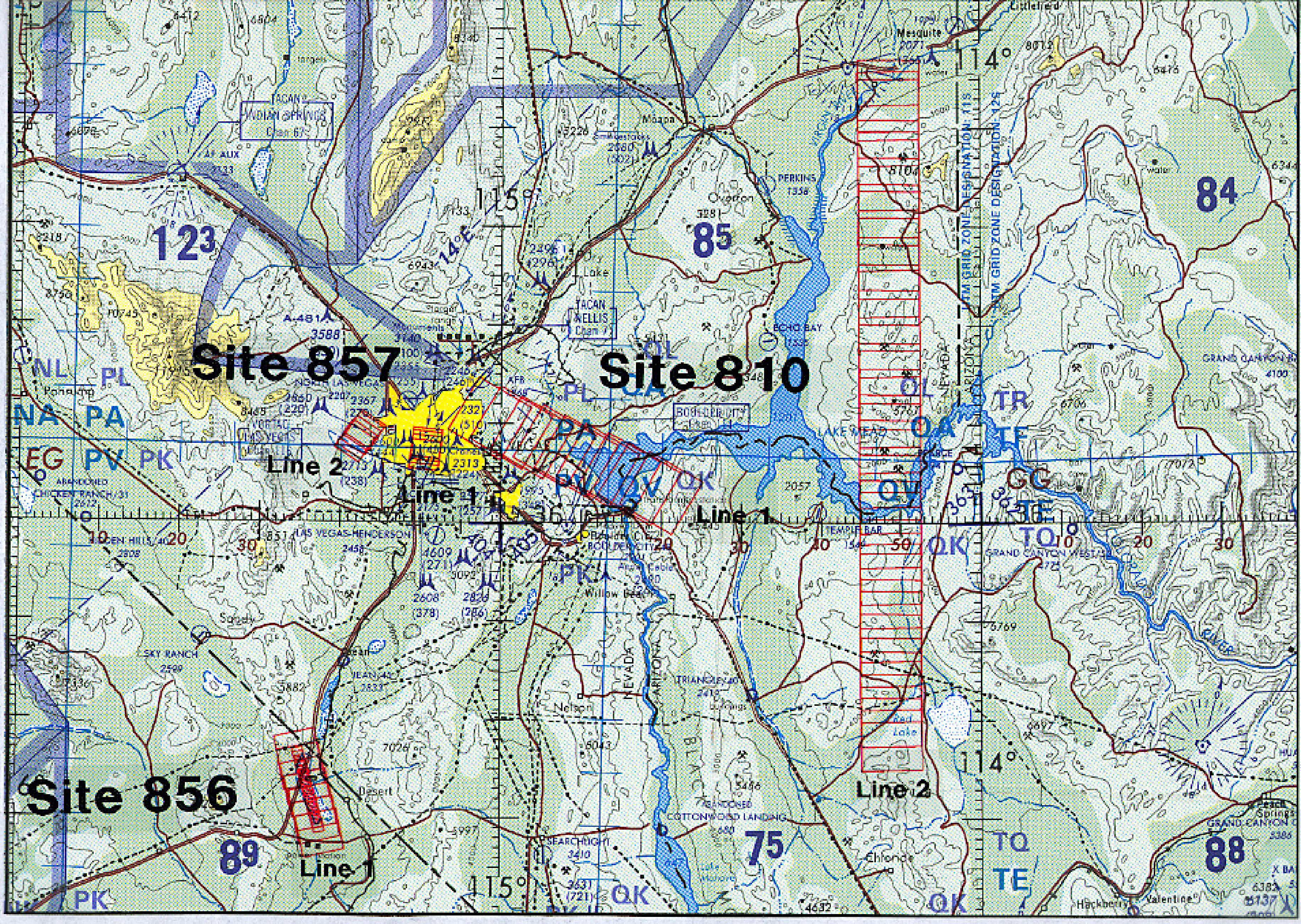

FLIGHT 98-008-01 12 AUGUST 1998 A/C 798 (KINGAIR B200) RC-30 ONC G-18