

# FLIGHT SUMMARY REPORT

**Flight Number:** 95-052  
**Calendar/Julian Date:** 28 January 1995 • 028  
**Sensor Package:** Wild Heerbrugg RC-10  
Dual Hycon HR-732  
Modis Airborne Simulator (MAS)  
Aerosol Particulate Sampler (APS)  
**Area(s) Covered:** Louisiana

**Investigator(s):** Handley, USFWS; State of Louisiana;  
Cunningham, Army Corps of Engineers **Aircraft #:** 706

## SENSOR DATA

<b>Accession #:</b>	04866	04867	04868
<b>Sensor ID #:</b>	034	020	039
<b>Sensor Type:</b>	RC-10	HR-732	HR-732
<b>Focal Length:</b>	12" 304.66 mm	24" 609 mm	24" 609 mm
<b>Film Type:</b>	Aerochrome IR SO-060	Aerochrome IR SO-060	Aerochrome IR SO-060
<b>Filtration:</b>	Wratten 12	Wratten 12	Wratten 12
<b>Spectral Band:</b>	510-900 nm	510-900 nm	510-900 nm
<b>f Stop:</b>	8	11	11
<b>Shutter Speed:</b>	1/240	1/250	1/250
<b># of Frames:</b>	456	492	396
<b>% Overlap:</b>	60	60	60
<b>Quality:</b>	Excellent	Excellent	Excellent
<b>Remarks:</b>			

## SENSOR DATA continued

Flight Number: 95-052

Accession #:	----	----
Sensor ID #:	108	024
Sensor Type:	MAS	APS
Focal Length:	----	----
Film Type:	----	----
Filtration:	----	----
Spectral Band:	----	----
f Stop:	----	----
Shutter Speed:	----	----
# of Frames:	----	----
% Overlap:	----	----
Quality:	----	----
Remarks:		

## **Airborne Science and Applications Program**

The Airborne Science and Applications Program (ASAP) is supported by three ER-2 high altitude Earth Resources Survey aircraft. These aircraft are operated by the High Altitude Missions Branch at NASA-Ames Research Center, Moffett Field, California. 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.

### **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 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

### **Aerosol Particulate Sampler**

The Aerosol Particulate Sampler (APS) has been developed and is operated by Dr. Guy Ferry of the NASA-Ames Research Experiments Branch. The sampler is a non-imaging sensor designed to gather high altitude dust particles for laboratory research.

## 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 12-bit channels of multispectral data and is configured as follows:

Spectral Channel	Band center (μm)	Bandwidth (μm)	Spectral Range
1	0.549	0.044	0.527-0.571
2	0.658	0.053	0.631-0.684
3	0.704	0.042	0.683-0.725
4	0.745	0.041	0.725-0.766
5	0.786	0.041	0.765-0.807
6	0.827	0.042	0.806-0.848
7	0.869	0.042	0.848-0.891
8	0.909	0.033	0.893-0.926
9	0.947	0.046	0.924-0.970
10	1.608	0.053	1.582-1.635
11	1.670	0.052	1.644-1.695
12	1.723	0.05	1.698-1.748
13	1.775	0.05	1.750-1.800
14	1.825	0.046	1.802-1.849
15	1.88	0.045	1.856-1.901
16	1.93	0.45	1.909-1.954
17	1.98	0.048	1.955-2.003
18	2.03	0.048	2.005-2.053
19	2.08	0.047	2.056-2.103
20	2.128	0.047	2.105-2.152
21	2.177	0.047	2.154-2.201
22	2.227	0.047	2.203-2.250
23	2.276	0.047	2.253-2.300
24	2.326	0.047	2.303-2.350
25	2.375	0.047	2.351-2.398

Spectral Channel	Band center (μm)	Bandwidth (μm)	Spectral Range
26	2.958	0.136	2.889-3.026
27	3.119	0.123	3.058-3.181
28	3.265	0.146	3.192-3.338
29	3.437	0.142	3.366-3.509
30	3.565	0.144	3.493-3.637
31	3.747	0.138	3.668-3.816
32	3.893	0.156	3.815-3.971
33	4.064	0.143	3.992-4.135
34	4.156	0.065	4.124-4.189
35	4.389	0.113	4.332-4.446
36	4.514	0.140	4.444-4.584
37	4.647	0.144	4.575-4.720
38	4.823	0.179	4.734-4.913
39	4.992	0.145	4.919-5.064
40	5.139	0.122	5.078-5.120
41	5.275	0.124	5.214-5.337
42	8.557	0.396	8.359-8.755
43	9.711	0.509	9.457-9.966
44	10.473	0.441	10.252-10.693
45	10.976	0.439	10.757-11.196
46	11.929	0.421	11.719-12.140
47	12.822	0.376	12.634-13.010
48	13.190	0.447	12.966-13.413
49	13.661	0.587	13.368-13.954
50	14.155	0.395	13.957-14.352

### 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.)

The U.S. Geological Survey's EROS Data Center at Sioux Falls, South Dakota serves as the archive and product distribution facility for NASA-Ames aircraft acquired photographic and digital imagery. 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)

Additional information regarding ER-2 acquired photographic and digital data is available through the Aircraft Data Facility at Ames Research Center. For specific information regarding flight documentation, sensor parameters, and areas of coverage contact the Aircraft Data Facility, NASA-Ames Research Center, Mail Stop 240-6, Moffett Field, California 94035-1000 (Telephone: 415-604-6252).

**CAMERA FLIGHT LINE DATA  
FLIGHT NO. 95-052**

Accession # 04866

Sensor # 034

Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
A - B	1077-1145	16:22:37	16:55:08	64525/19667	Very minor cumulus (frames 1090-1092)
C - D	1146-1209	16:59:45	17:29:50	65345/19917	Minor-20% cumulus (frames 1204-1209)
E - F	1210-1280	17:34:42	18:07:57	65466/19954	10-30% cumulus (frames 1210-1221)
G - I	1281-1360	18:11:45	18:49:33	65250/19888	10-90% cirrus (frames 1355-1360)
J - K	1361-1438	18:57:03	19:33:54	65362/19922	Very minor smoke (frames 1370-1372)
L - M	1439-1506	19:38:31	20:10:31	65543/19978	Clear
D - N	1507-1515	20:15:44	20:19:12	65200/19873	Clear
N - E	1516-1525	20:23:20	20:27:18	64640/19702	Clear
O - I	1526-1532	20:32:34	20:35:04	65429/19943	Clear
<b>APS ON/OFF TIME 16:04:00/21:16:00</b>					

**CAMERA FLIGHT LINE DATA  
FLIGHT NO. 95-052**

Accession # 04867

Sensor # 020

Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
A - B	0001-0134	16:22:09	16:54:29	64534/19670	Minor cumulus (frames 0026-0027)
C - D	0135-0259	16:59:10	17:29:13	65368/19924	Minor-20% cumulus (frames 0249-0259)
E - F	0260-0397	17:34:05	18:07:13	65471/19956	Minor-20% cumulus (frames 0260-0280)
G - H	0398-0492	18:11:10	18:33:52	65203/19874	Clear; emulsion damage (frames 0491-0492)

**CAMERA FLIGHT LINE DATA  
FLIGHT NO. 95-052**

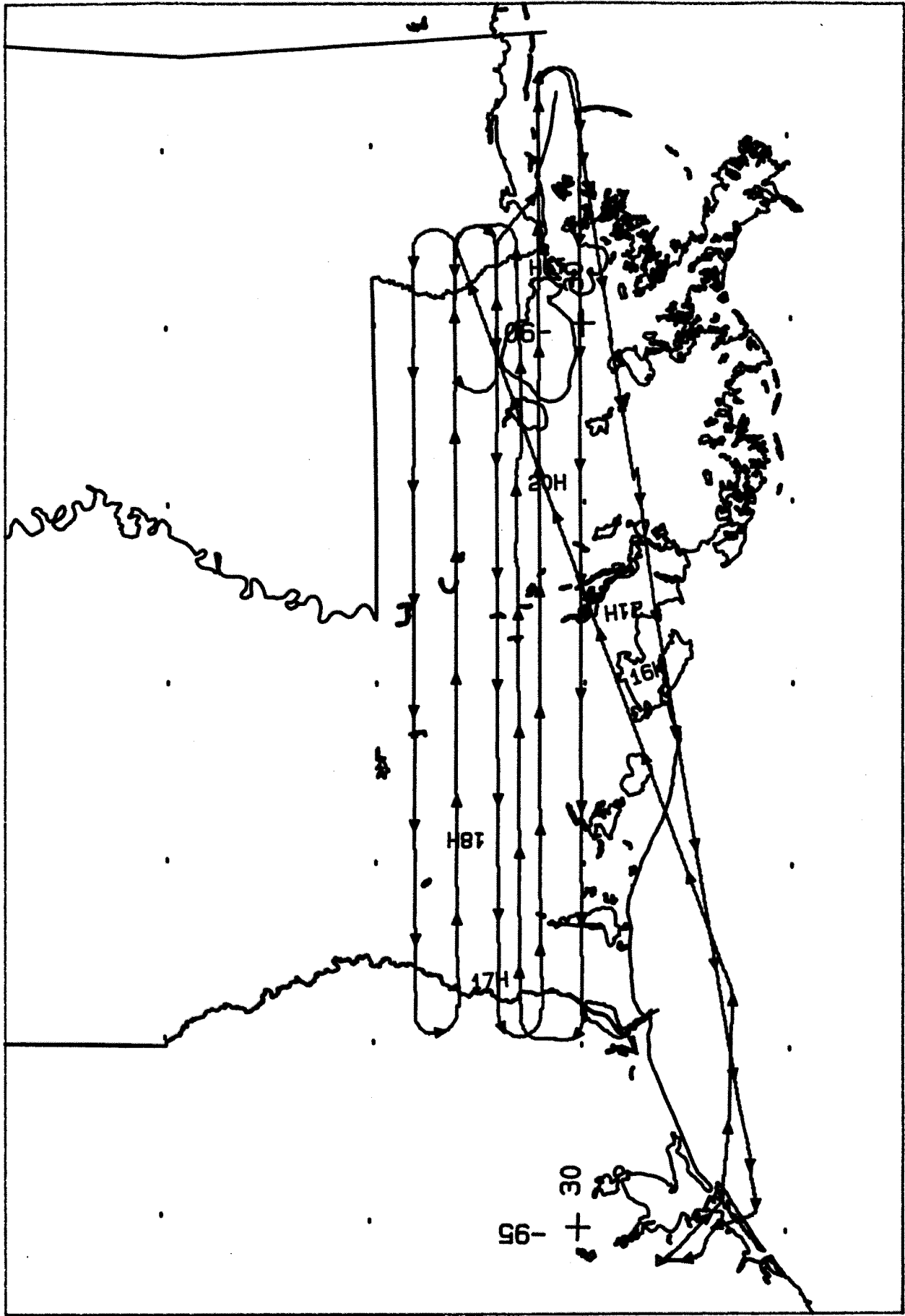
Accession # 04868

Sensor # 039

Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
H - I	0001-0063	18:34:11	18:49:10	65341/19916	10-90% cirrus (frames 0053-0063); light strike (frame 0001)
J - K	0064-0216	18:56:31	19:33:09	65373/19926	Minor smoke obstruction (frames 0081-0083); light strike (frame 0064)
L - M	0217-0350	19:37:59	20:10:01	65555/19981	Clear; light strike (frame 0217)
D - N	0351-0365	20:15:12	20:18:34	65213/19877	Clear
N - E	0366-0384	20:22:49	20:27:08	64726/19728	Clear
O - I	0385-0396	20:32:02	20:34:40	65467/19954	Clear; light strike (frame 0385)

**NOTE: INTERMITTENT PRESSURE MARKS/STATIC DISCHARGE THROUGHOUT DATA**





FLIGHT 85-052      26 JANUARY 1985      A/C 706      RC-10 / DUAL HR-732 / MAS



