

# FLIGHT SUMMARY REPORT

**Flight Number:** 95-044  
**Calendar/Julian Date:** 08 January 1995 • 008  
**Sensor Package:** Wild Heerbrugg RC-10  
Dual Hycon HR-732  
Modis Airborne Simulator (MAS)  
Aerosol Particulate Sampler (APS)  
**Area(s) Covered:** Louisiana Gulf Coast

**Investigator(s):** Handley, USFWS;  
Menzel, U. of Wisconsin

**Aircraft #:** 706

## SENSOR DATA

<b>Accession #:</b>	04853	04854	04855
<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	9.6	9.6
<b>Shutter Speed:</b>	1/170	1/250	1/250
<b># of Frames:</b>	561	214	497
<b>% Overlap:</b>	60	60	60
<b>Quality:</b>	Good	Good	Good
<b>Remarks:</b>			

# SENSOR DATA continued

Flight Number: 95-044

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. 95-044**

Accession # 04853

Sensor # 034

Page 1/2

Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
A - B	9617-9691	14:59:04	15:34:51	62824/19149	Clear
C - D	9692-9716	15:42:53	15:54:06	62992/19200	Clear
E - F	9717-9750	16:02:23	16:17:56	62926/19180	Clear
G - H	9751-9788	16:23:10	16:40:39	63489/19351	Smoke obstruction (frames 9786-9788); processing residue (frame 9780)
I - A	9789-9823	16:47:42	17:03:44	63837/19458	Clear
J - K	9824-9902	17:06:35	17:43:52	64553/19676	Smoke obstruction (frames 9851-9853)
L - M	9903-9927	17:47:21	17:58:32	64718/19726	Minor cumulus (frames 9916-9917); processing residue (frame 9914)
M	9928-9937	17:59:01	18:03:22	65349/19918	Frames acquired in turn; minor cumulus (frames 9932-9933)
M - N	9938-0006	18:03:51	18:36:42	65938/20098	Smoke obstruction (frames 9974-9977 and 0002-0004)

**CAMERA FLIGHT LINE DATA**  
**FLIGHT NO. 95-044**

Accession # 04853

Sensor # 034

Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
O - P	0007-0082	18:40:50	19:16:41	65938/20098	Smoke obstruction (frames 0068-0070)
Q - R	0083-0174	19:21:09	20:04:43	65938/20098	Minor smoke (frames 0101-0102 and 0156-0157); minor-10% cumulus (frames 0104-0106, 0115-0117, and 0128-0131); smoke obstruction (frames 0133-0135, 0141-0143, and 0170-0171)
R	0175-0177	20:05:12	20:06:10	65938/20098	10% cumulus; oblique (frames 0175-0176)

**CAMERA FLIGHT LINE DATA  
FLIGHT NO. 95-044**

Accession # 04854

Sensor # 020

Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
J - K	0001-0166	17:06:25	17:43:32	64524/19667	Smoke obstruction (frames 0057-0060)
L - M	0167-0214	17:47:11	17:57:45	64569/19681	Minor-10% cumulus (frames 0193-0195)

NOTE: INTERMITTENT STATIC DISCHARGES/PRESSURE MARKS THROUGHOUT DATA

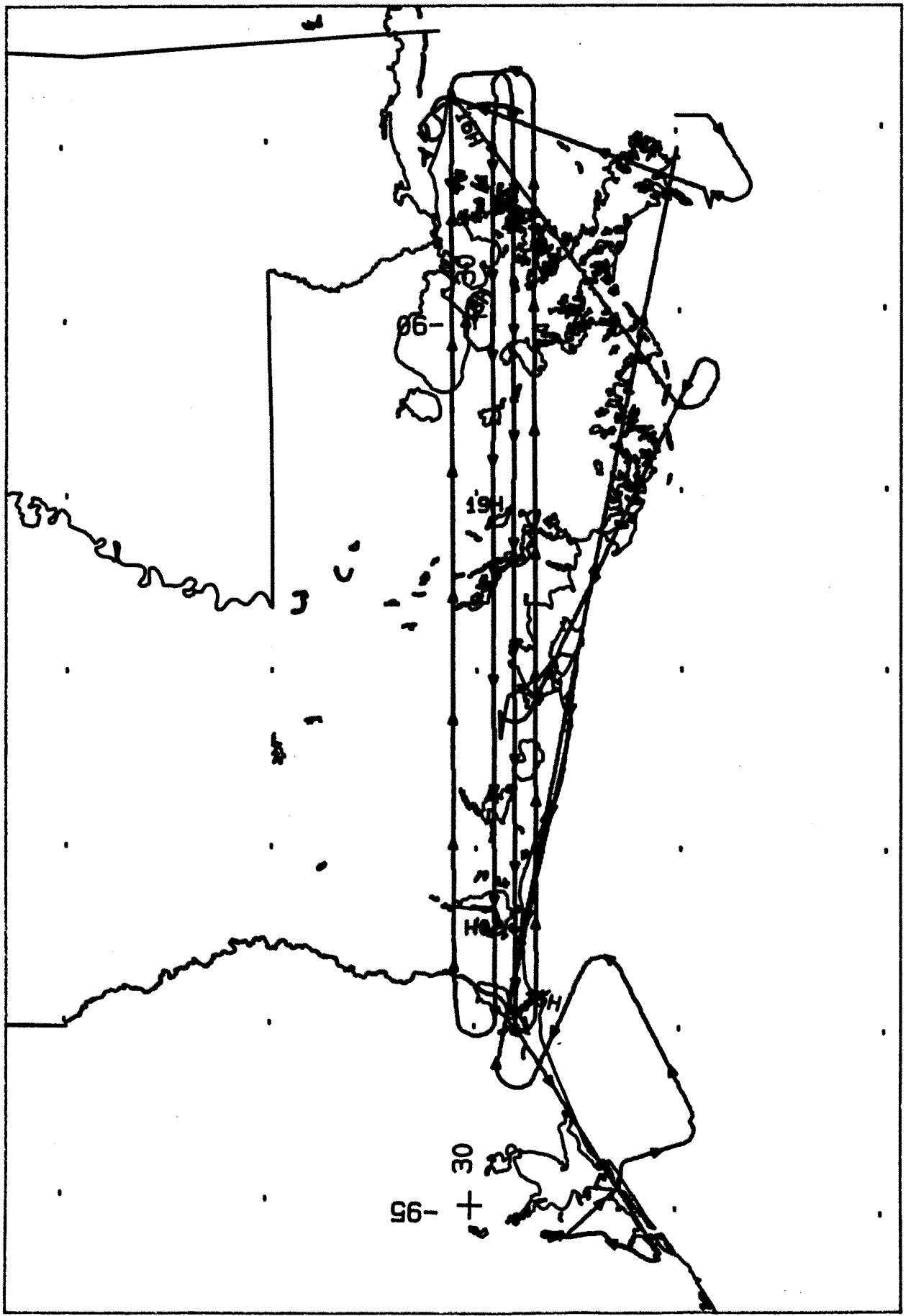


**CAMERA FLIGHT LINE DATA  
FLIGHT NO. 95-044**

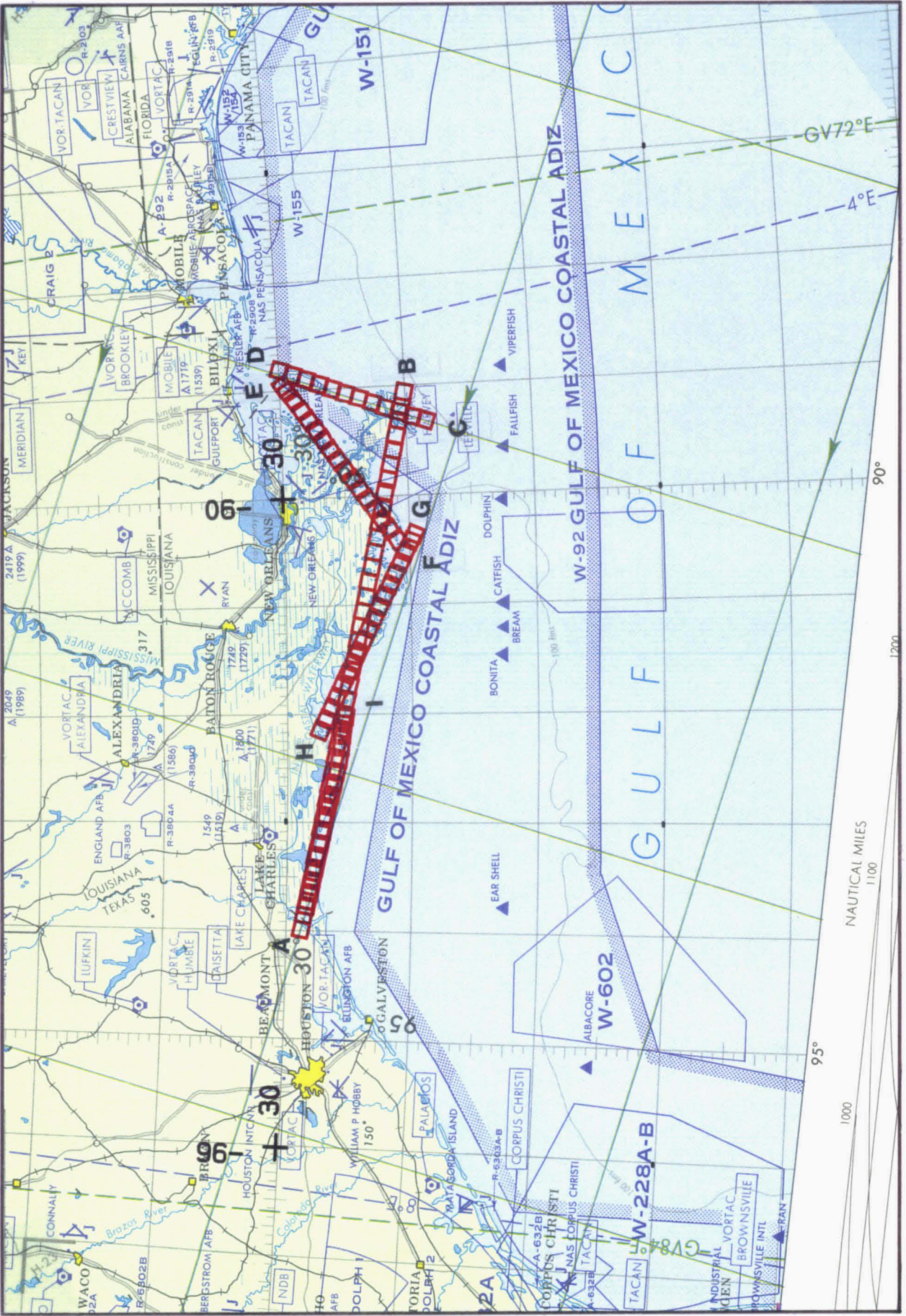
Accession # 04855

Sensor # 039

Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
M - N	0001-0147	18:03:15	18:36:10	64834/19761	Smoke obstruction (frames 0075-0077, 0081-0084, and 0140-0142); light strike (frame 0001)
O - P	0148-0308	18:40:33	19:16:39	65332/19913	Smoke obstruction (frames 0276-0279); light strike (frame 0148); emulsion abrasion (frame 0264)
Q - R	0309-0497	19:20:51	20:03:15	65916/20091	Minor smoke (frames 0344-0348); minor-10% cumulus (frames 0352-0354, 0377-0379, 0398-0400, 0403-0409, and 0413-0414); smoke obstruction (frames 0415-0416, 0429-0431, 0433-0438, 0465-0466, and 0493-0495); light strike (frame 0309)
<b>NOTE: INTERMITTENT STATIC DISCHARGES/PRESSURE MARKS THROUGHOUT DATA</b>					
<b>APS ON/OFF TIME 14:56:00/20:09:00</b>					



FLIGHT 95-044      8 JANUARY 1995      A/C 706      RC-10 / DUAL HR-732 / MAS



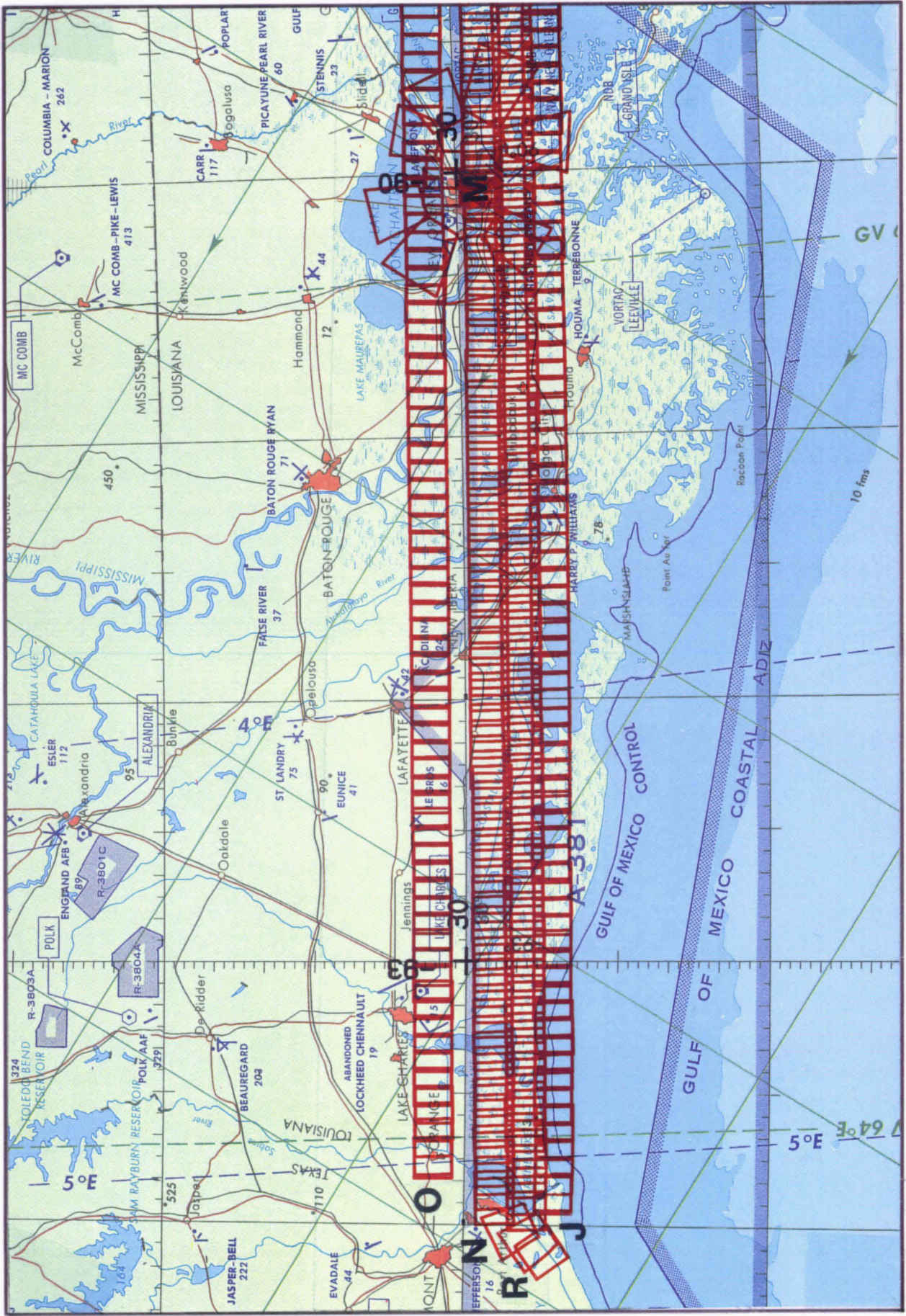
FLIGHT 95-044

8 JANUARY 1995

A/C 706

RC-10

ENC 2



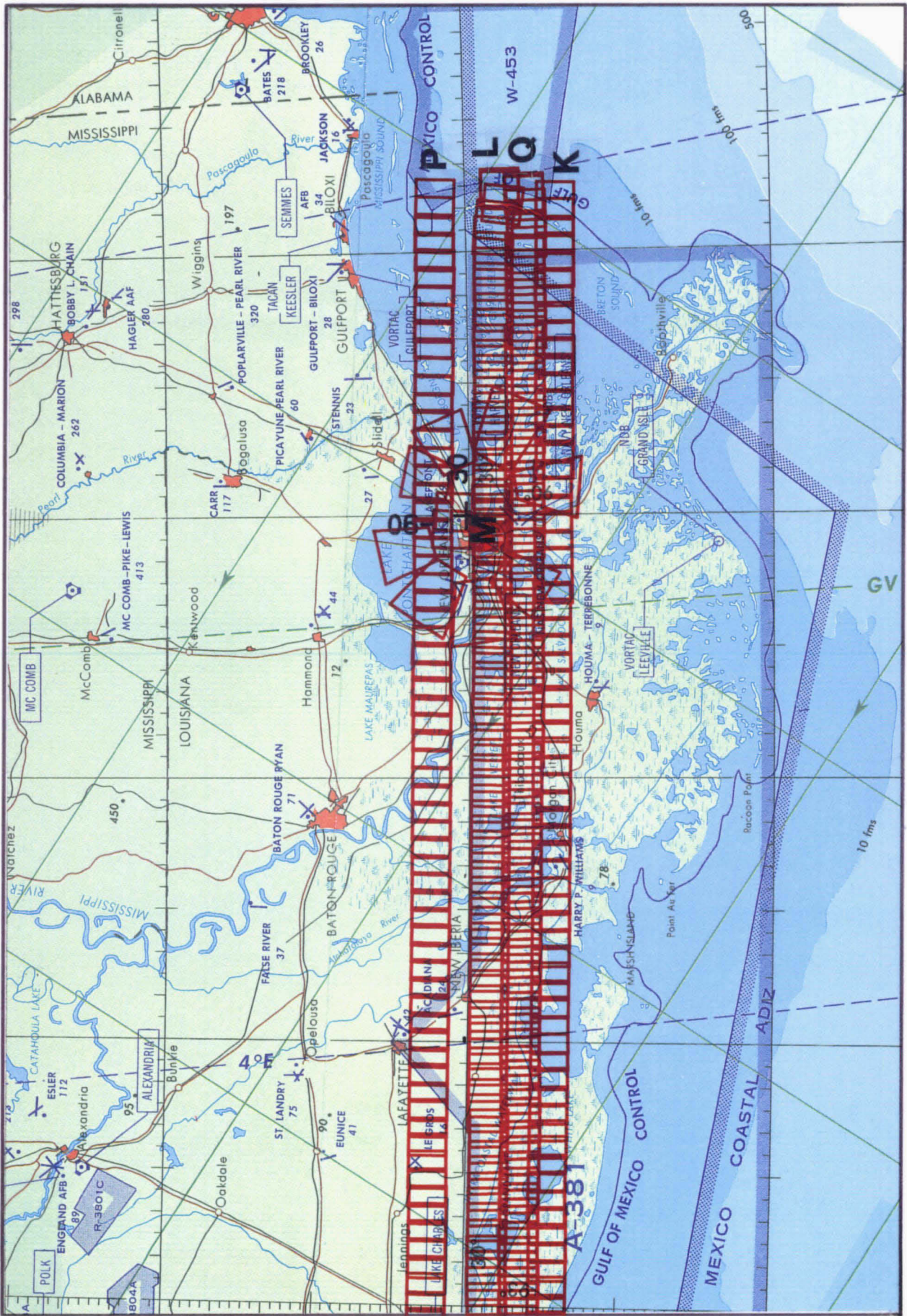
JNC 44

RC-10 / DUAL HR-732

A/C 706

8 JANUARY 1995

FLIGHT 95-044



FLIGHT 95-044      8 JANUARY 1995      A/C 706      RC-10 / DUAL HR-792      JNC 44