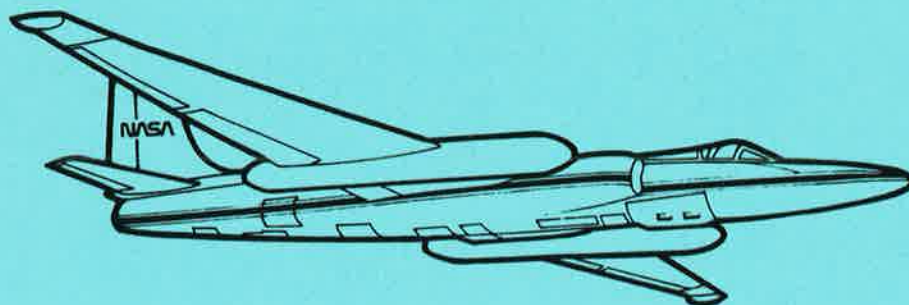


# Airborne Instrumentation Research Project

## Flight Summary Report

Flight No. 88-124

Date 05 September 1988



**Science and Applications Aircraft Division**

**NASA**

National Aeronautics and  
Space Administration

**Ames Research Center**  
Moffett Field, California 94035

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F58

# FLIGHT SUMMARY REPORT

Flight Number: 88-124 Date: 05 September 1988

Julian Date: 249

Aircraft No: 706

Sensor Package: Dual Wild-Heerbrug RC-10 Cameras  
Hycon HR732 Camera  
Airborne Ocean Color Imager (AOCI)

Purpose of Flight: # 88R251  
Requestor: Wrigley, NASA/ARC

Area(s) Covered: Mississippi Delta

## SENSOR DATA

Accession No:	03790	03791
Sensor ID No:	076	033
Sensor Type:	RC-10	RC-10
Focal Length:	12-inch 304.89 mm	6-inch 153.17 mm
Film Type:	High Definition Aerochrome Infrared, SO-127	Panatomic-X Aerial 3400
Filtration:	cc .20B	Wratten-12
Spectral Band:	510-900 nm	510-700 nm
f Stop:	4	5.6
Shutter Speed:	1/225	1/200
No. of Frames:	105	26
% Overlap:	60	60
Quality:	Fair	Good
Remarks:	See write up.	See write up.

Sensor Data (Continued)

Accession No.	03792	-----
Sensor No.	039	090
Sensor Type:	HR732	AOCI
Focal Length:	24-inch 609.6mm	----- -----
Film Type:	High Definition Aerochrome Infrared, S0-131	----- -----
Filtration:	cc .20B	-----
Spectral Band:	510-900nm	See write up.
f Stop:	8	-----
Shutter Speed:	1/75	-----
No. of Frames:	91	-----
% Overlay:	60	-----
Quality:	Excellent	Good
Remarks:	See write up.	See write up.

## FLIGHT SUMMARY

88-124

This flight was flown in support of Flight Request # 88R251 (Wrigley, NASA/ARC) under the FY 1988 Airborne Instrumentation Research Program (AIRP) Plan. Color infrared and black and white photographic data and Airborne Ocean Color Imager data were acquired over selected sites along the Mississippi Delta (See Track Map).

Minor to moderate scattered cumulus was encountered during a major portion of the flight. The film from sensor no. 076 is slightly underexposed and the quality is also degraded due to processing stains throughout the roll. Sensor no. 039 frames throughout the flight are partially light struck near the data block due to a magazine malfunction. No other processing or camera malfunctions were noted and the quality of the data is rated from fair to excellent.

### Airborne Ocean Color Imager

The AOCI is a high altitude multispectral scanner designed for oceanographic remote sensing. It provides 10-bit digitization of 8 bands in the visible/near-IR region of the spectrum, plus 2 8-bit bands in the near and thermal IR. The bandwidths are as follows:

<u>Channel</u>	<u>Wavelength (um)</u>
1	0.436 - 0.455
2	0.481 - 0.501
3	0.511 - 0.531
4	0.554 - 0.575
5	0.610 - 0.631
6	0.655 - 0.676
7	0.741 - 0.800
8	0.831 - 0.897
9	0.989 - 1.054
10	8.423 - 12.279

### Sensor/Aircraft Parameters are:

IFOV: 2.5 mrad  
Ground Resolution: 163 ft. (50 meters) at 65,000 ft.  
Total Scan Angle: 85°  
Swath Width: 18nmi (33.3km)  
Pixels/Scanline: 716  
Scan Rate: 6.25 scans/sec  
Aircraft Velocity: 390 kts (200 m/sec)

Airborne Ocean Color Imager Calibration Data

Flight No: 88-124

AOCI Channel Number	Radiance/Count (mW/cm2*um*sr/count)
1	0.0212
2	0.0182
3	0.0115
4	0.0157
5	0.0098
6	0.0092
7	0.0027
8	ERR
9	ERR

(Radiance/Count should be multiplied by gray-level value to obtain radiance. No "tare" correction is necessary.)

Thermal Data

The thermal data (channel 12) is uncalibrated on the AOCI as Blackbody Reference #2 is replaced by a visible calibration lamp.

## AOCI SCANNER DATA TAPE FORMAT

The Applications Aircraft Data Management Facility converts scanner data recorded on 14-track high density tape to standard 9-track computer-compatible tapes (CCT) for the user. Density of CCTs can be 6250, 1600 or 800 bpi, depending on the user's preference. The logical record length is fixed at 741 16-bit words. The first 25 words of each record is house-keeping information; the next 716 words are digitized video pixel data.

All channels for a particular flight segment are written in a single tape file. All channels of a single scanline are contained sequentially in a single record, as follows:

```
record 1 = scanline 1, channel 1; scanline 1, channel 2;...;scanline 1, channel 10
record 2 = scanline 2, channel 1; scanline 2, channel 2;...;scanline 2, channel 10
...
...
...
record n = scanline n, channel 1; scanline n, channel 2;...;scanline n, channel 10
```

The physical record length is ten times the logical record length (741,) or 7410 16-bit bytes.

AOCI DATA  
LOGICAL RECORD FORMAT

16-Bit WORD NUMBER	CONTENTS
1-25	Channel Scanline Housekeeping Information
1	Data Frame Status
	0 Good frame
	10-16 Interpolated data
	20-26 Repeated data
	30-36 Zero-fill for data
2	Run number
3-4	Scanline number (32-bit integer)
5-6	Thumbwheel switched (32-bit integer): expressed as 8 digits in the form YYFFFJJJ, where YY is the last two digits of the year FFF is the flight number JJJ is the Julian day of the year
7	Blackbody 1 thermal reference temperature (degrees C * 100)
8	Blackbody 2 thermal reference temperature (degrees C * 100)
9	Scan speed (scans/second * 10)
10	GMT hours
11	GMT minutes
12	GMT seconds ( * 10)
13	Demagnification value ( *100)
14	Filler
15	Gain value ( * 100)
16	Channel number
17-18	Time (32-bit integer): expressed as a 7-digit number in the form HHMMSS
19	Black body 1 radiance count
20	Black body 2 radiance count
21	Aircraft roll angle (signed integer, positive is left): 0.03 degrees per count, 0.06 degrees per pixel, and thus two counts per pixel.
22-25	Filler
26-741	Digitized Video Pixel Information
26	Digitized video pixel no. 1
27	Digitized video pixel no. 2
28	Digitized video pixel no. 3
*	*
*	*
*	*
740	Digitized video pixel no. 715
741	Digitized video pixel no. 716

Note: Housekeeping information consists of 16-bit integers, unless otherwise noted. Video pixel data consists of 10 bits of actual data packed into the 10 least significant bits of a 16 bit word, except channels 9 and 10, which consist of 8 bits of data in the 8 least significant bits of a 16 bit word.

**SCANNER FLIGHT LINE DATA**  
**FLIGHT NO. 88-124**

DAEDALUS FLIGHT DATA  
 FLIGHT NUMBER: 88-124

Check Points	flightline number	Actual time (GMT)		Actual scanline		Altitude feet/meter	Scan Speed (rps)	total G o o d scanlines	total Interpolated scanlines	total Repeated scanlines	total Zero-fill scanlines
		begin	end	begin	end						
A-B	1	14:29:23.0	14:39:39.0	47595	51441	65000/19812	6.25	3835	0	12	0
C-D	2	14:43:11.0	14:53: 6.0	52768	56486	65000/19812	6.25	3693	0	26	0
E-F	3	14:57: 4.0	15:01:47.0	57973	59746	65000/19812	6.25	1742	0	32	0
G-H	4	15:09:59.0	15:16:46.0	62815	65364	65000/19812	6.25	2534	0	16	0
I-J	5	15:20: 0.0	15:24:18.0	66576	68189	65000/19812	6.25	1601	0	13	0
K-L	6	15:29:42.0	15:36:40.0	70211	72824	65000/19812	6.25	2601	0	13	0
M-N	7	15:41: 9.0	15:45:26.0	74506	76109	65000/19812	6.25	1601	0	3	0



CAMERA FLIGHT LINE DATA  
 FLIGHT NO. 88-124

Accession No. 03790

Sensor #	Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
			START	END		
076	A - B	7571-7593	14:30:15	14:40:31	65000/19800	Clear
	C - D	7594-7616	14:44:05	14:53:31	"	Very minor scattered cumulus, Frames 7606-7611; Moderate to heavy strato-cumulus, Frames 7612-7616
	E - F	7617-7628	14:57:40	15:02:40	"	Moderate strato-cumulus, Frames 7617-7619
	G - H	7629-7638	15:09:59	15:17:20	"	Minor scattered cumulus, Frames 7629-7634 and 7636-7638
	I - J	7639-7649	15:20:15	15:25:08	"	Minor to moderate scattered cumulus, Frames 7639-7644
	K - L	7650-7663	15:32:21	15:38:00	"	Minor to moderate scattered cumulus, Frames 7657-7662
	M - N	7664-7675	15:42:01	15:46:12	"	Very minor to moderate scattered cumulus

CAMERA FLIGHT LINE DATA  
 FLIGHT NO. 88-124

Accession No. 03791

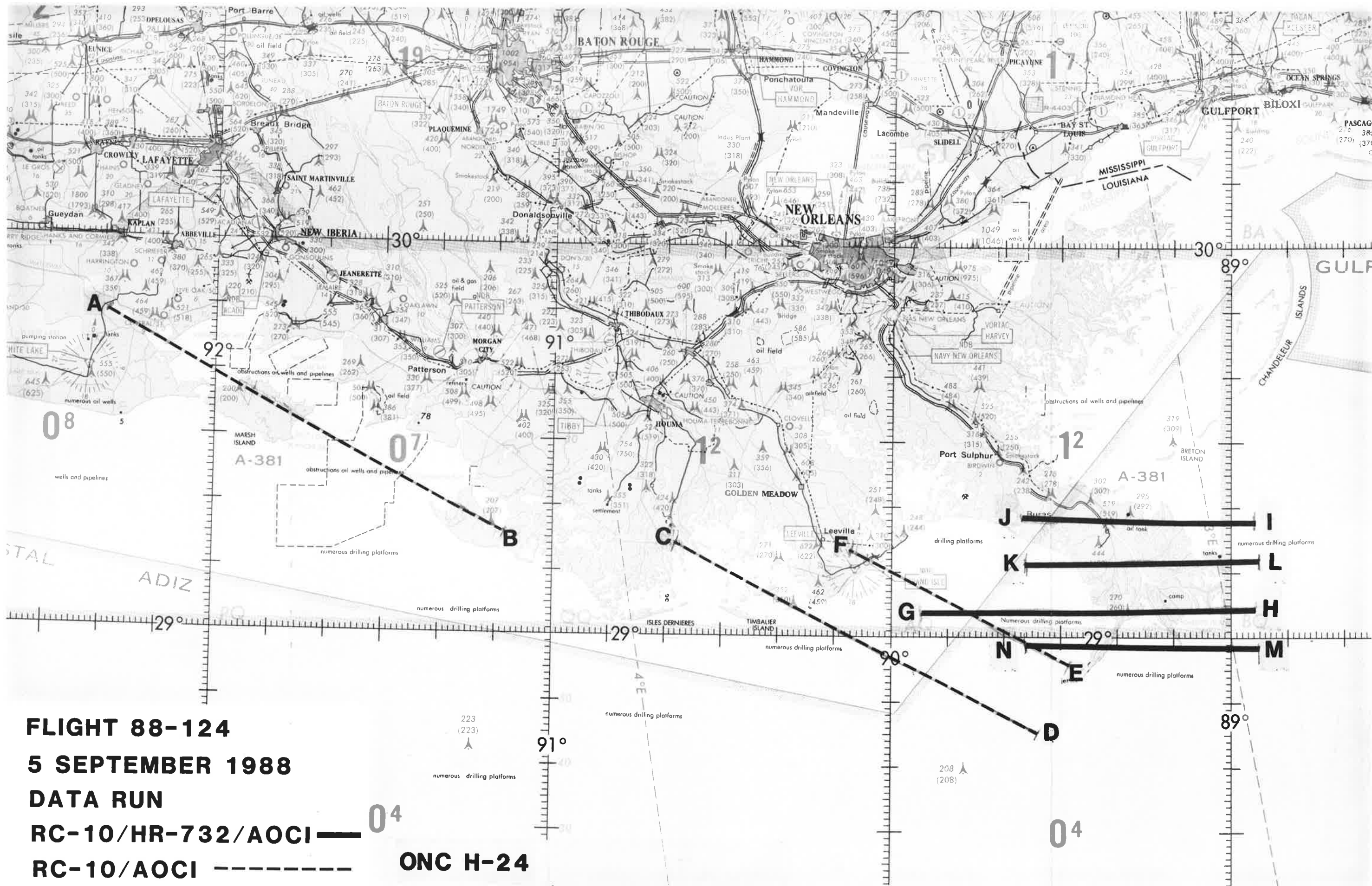
Sensor #  
033

Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
G - H	2818-2826	15:10:17	15:16:58	65000/19800	Minor to moderate scattered cumulus
I - J	2827-2831	15:20:23	15:24:10	"	Minor to moderate scattered cumulus, Frames 2827-2830
K - L	2832-2837	15:31:57	15:36:41	"	Minor to moderate scattered cumulus, Frames 2834-2837
M - N	2838-2843	15:41:34	15:45:51	"	Minor to moderate scattered cumulus

CAMERA FLIGHT LINE DATA  
 FLIGHT NO. 88-124

Accession No. 03792

Sensor #	Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
			START	END		
039	G - H	0001-0028	15:09:59	15:16:24	65000/19800	Very minor scratch or film, Frames 0001-0009; Minor to moderate scattered cumulus, Frames 0012-0020 and 0024-0028
	I - J	0029-0047	15:19:48	15:24:07	"	Very minor to moderate scattered cumulus, Frames 0029-0038
	K - L	0048-0072	15:31:24	15:37:01	"	Minor to moderate scattered cumulus, Frames 0059-0068
	M - N	0073-0091	15:40:59	15:45:16	"	Very minor scattered cumulus, Frames 0073-0076; Very minor to moderate scattered cumulus, Frames 0080-0091; Film defect, Frame 0090



**FLIGHT 88-124**

**5 SEPTEMBER 1988**

**DATA RUN**

**RC-10/HR-732/AOCI** ———

**RC-10/AOCI** - - - - -

**04**

**ONC H-24**

**04**