

FLIGHT SUMMARY REPORT

Flight Number: 95-173
Calendar/Julian Date: 22 September 1995 • 265
Sensor Package: Dual Hycon HR-732
Modis Airborne Simulator (MAS)
Area(s) Covered: Puerto Rico, St. Thomas

Investigator(s): Joyce, NASA Stennis

Aircraft #: 708

SENSOR DATA

Accession #:	05004	05005	---
Sensor ID #:	039	020	108
Sensor Type:	HR-732	HR-732	MAS
Focal Length:	24" 609.6mm	24" 609.6mm	---
Film Type:	Aerochrome IR SO-134	Aerocolor Negative 2445	---
Filtration:	Wratten 12	None	---
Spectral Band:	510-900 nm	400-70nm	---
f Stop:	14.2	18	---
Shutter Speed:	1/250	1/250	---
# of Frames:	265	244	---
% Overlap:	60	60	---
Quality:	Good	Excellent	---
Remarks:	Light strikes and emulsion abrasions		

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

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. 95-173**

Accession # 05004

Sensor # 039

Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
A - B	0001-0026	13:45:13	13:51:25	65000/19812	Minor-20% cumulus frs 0001-0008 and 0012-0022
C - D	0027-0078	13:54:21	14:06:57	65000/19812	20-60% stratus frs 0027-0034; minor-50% cumulus frs 0034-0068; minor-20% cumulus frs 0072-0078
E - F	0079-0136	14:13:49	14:27:49	65000/19812	10-80% cumulus throughout; 10-40% stratus frs 0080-0085 and 0116-0120
G - H	0137-0200	14:33:58	14:49:23	65000/19812	20-70% cumulus throughout; 10-30% stratus 0137-0139 and 0153-0155
I - J	0201-0220	15:01:14	15:05:51	65000/19812	20-30% cumulus throughout, 10-20% stratus frames 0214-0220
K - L	0221-0265	15:15:12	15:25:54	65000/19812	10-80% cumulus throughout; 10-80% stratus frames 0250-0263

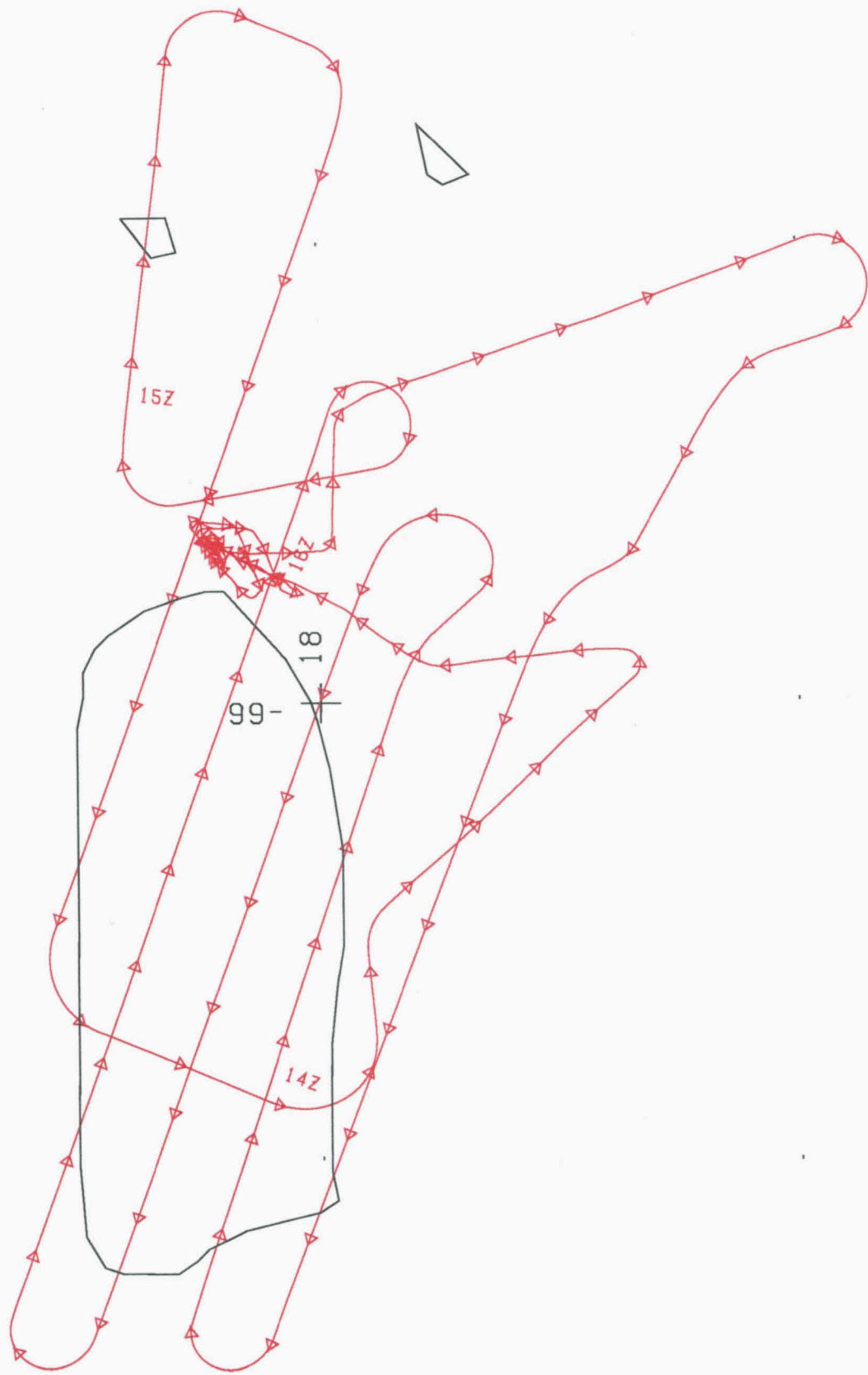
NOTE: Light strike appears near data block and emulsion scratches are at top of image throughout film roll.

**CAMERA FLIGHT LINE DATA
FLIGHT NO. 95-173**

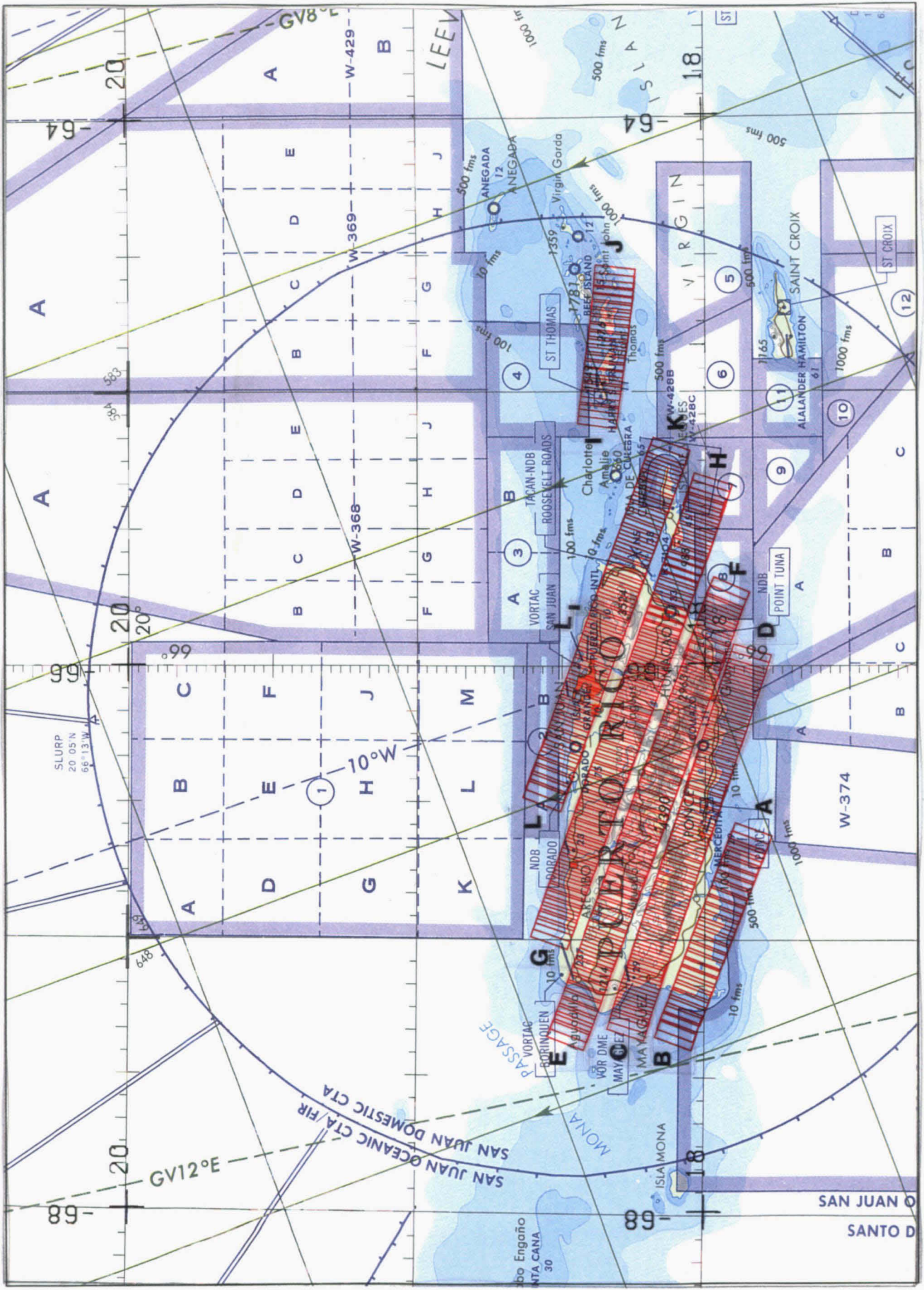
Accession # 05005

Sensor # 020

Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
A - B	0001-0026	13:46:16	13:52:30	65000/19812	Minor-20% cumulus frs 0001-0008 and 0012-0022
C - D	0027-0078	13:55:26	14:08:02	65000/19812	20-60% stratus frs 0027-0034; minor-50% cumulus frs 0034-0068; minor-20% cumulus frs 0072-0078
E - F	0079-0136	14:14:54	14:28:54	65000/19812	10-80% cumulus throughout; 10-40% stratus frs 0080-0085 and 0116-0120
G - H	0137-0200	14:35:03	14:50:28	65000/19812	20-70% cumulus throughout; 10-30% stratus 0137-0139 and 0153-0155
I - J	0201-0220	15:02:19	15:06:56	65000/19812	20-30% cumulus throughout, 10-20% stratus frames 0214-0220
K - L	0221-0244	15:16:16	15:21:53	65000/19812	10-80% cumulus throughout



FLIGHT 95-173 22 SEPTEMBER 1995 A/C 708 DUAL HR732 / MAS-50



FLIGHT 95-173

22 SEPTEMBER 1995

A/C 708

DUAL HR-732 / MRS

JNC-47