

FLIGHT SUMMARY REPORT

Flight #: 90-070
Date: 08 April 1990
Sensor Package: Wild-Heerbrug RC-10
Hycon HR-732
Thematic Mapper Simulator (TMS)
Area(s) Covered: Kentucky

Investigator(s): Weber, USDA

Aircraft #: 709

Flight Request: 90R258

Julian Date: 098

SENSOR DATA

Accession #:	04017	04018	-----
Sensor ID #:	026	018	101
Sensor Type:	RC-10	HR-732	TMS
Focal Length:	12" 304.97 mm	24" 604.6 mm	-----
Film Type:	High Definition Aerochrome IR SO-131	Aerial Color SO-242	-----
Filtration:	cc.10B	-----	-----
Spectral Band:	510-900 nm	400-700 nm	-----
f Stop:	4	8	-----
Shutter Speed:	1/150	1/75	-----
# of Frames:	96	178	-----
% Overlap:	60	60	-----
Quality:	Fair	Excellent	Good
Remarks:	Image degradation due to filter buckling		

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.

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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 used for data collection during this flight.

Thermal Infrared Multispectral Scanner

The Thermal Infrared Multispectral Scanner (TIMS) is a multispectral scanning system using a dispersive grating and a six element mercury cadmium telluride detector array to produce six discrete channels in the 8.2 μm to 12.2 μm region.

<u>Channel</u>	<u>Wavelength, μm</u>	<u>NET</u>
1	8.2 - 8.6	< 0.3 ^o C
2	8.6 - 9.0	< 0.3 ^o C
3	9.0 - 9.4	< 0.3 ^o C
4	9.4 - 10.2	< 0.3 ^o C
5	10.2 - 11.2	< 0.3 ^o C
6	11.2 - 12.2	< 0.3 ^o C

Sensor/aircraft parameters are as follows:

IFOV:	2.5 mrad
Ground Resolution:	163 feet (50 meters) at 65,000 feet
Total Scan Angle:	76.56 ^o
Swath Width:	16.9 nmi (31.3 km)
Pixels/Scan Line:	638
Scan Rate:	7.3 (scans/second)
Ground Speed:	400 kts. (206 m/second)

NOTE: Information on data tape format, logical record format, and scanner calibration data may be obtained from the NASA-Ames Aircraft Data Facility at (415) 604-6252 or FTS 464-6252.

CAMERA FLIGHT LINE DATA
FLIGHT NO. 90-070

Accession # 04017

Sensor # 026

Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
A - B	1485-1497	16:38:05	16:43:14	65000/19800	Clear
C - D	1498-1512	16:46:55	16:52:40	"	Clear
E - F	1513-1518	16:59:38	17:01:16	"	Clear
G - H	1519-1531	17:07:02	17:12:11	"	Clear
I - J	1532-1545	17:15:21	17:20:57	"	Clear
K - L	1546-1560	17:24:10	17:29:58	"	Clear
M - C	1561-1568	17:35:07	17:37:58	"	Clear
F - E	1569-1580	17:41:43	17:46:24	"	Clear

Soft focus on 20% of frame (trailing edge) due to buckling of gelatin filter throughout roll.

**CAMERA FLIGHT LINE DATA
FLIGHT NO. 90-070**

Accession # 04018

Sensor # 018

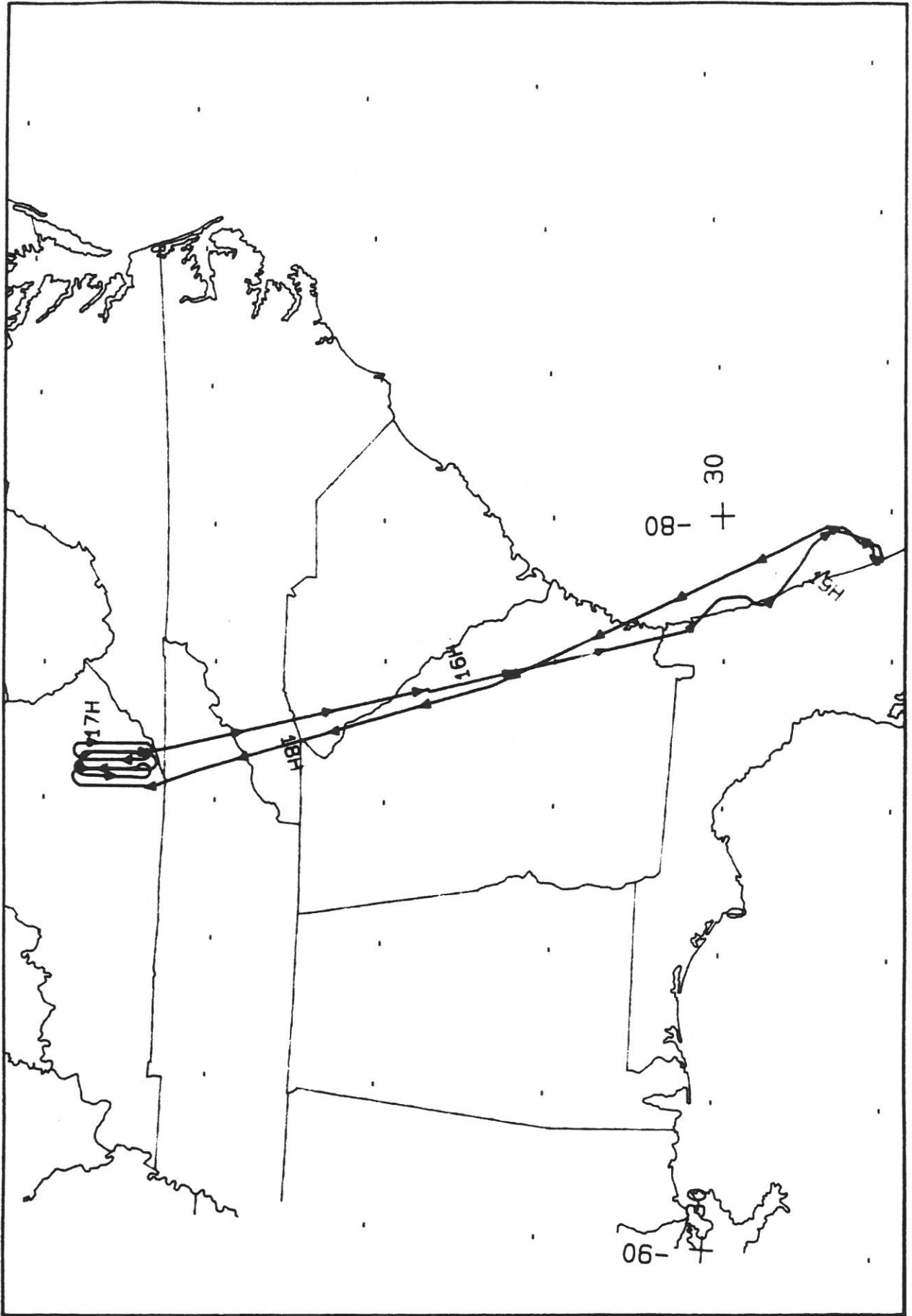
Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
A - B	0001-0023	16:37:12	16:42:26	65000/19800	Clear
C - D	0024-0051	16:46:03	16:52:51	"	Clear; oblique (frame 0051)
E - F	0052-0072	16:55:20	17:00:21	"	Clear
-----	0073	17:03:17	17:03:17	"	Clear; oblique
G - H	0074-0095	17:06:09	17:11:15	"	Clear
I - J	0096-0119	17:14:27	17:20:04	"	Clear
K - L	0120-0144	17:23:17	17:29:07	"	Clear
M - C	0145-0157	17:34:14	17:37:09	"	Clear
F - E	0158-0178	17:40:55	17:45:47	"	Clear

SCANNER FLIGHT LINE DATA

FLIGHT NO. 90-070

DAEDALUS FLIGHT DATA
FLIGHT NUMBER: 90-070

Check Points	A c t u a l t i m e b e g i n	A c t u a l s c a n l i n e b e g i n	A l t i t u d e f e e t / m e t e r	Scan S p e e d (r p s)	t o t a l G o o d s c a n l i n e s	t o t a l I n t e r p o l a t e d s c a n l i n e s	t o t a l R e p e a t e d s c a n l i n e s
A-B	15:35: 3.0 15:57:55.0	31212 48459	65000/19812	12.50	17201	0	47
C-D	15:59: 7.0 16:16:57.0	49363 62831	65000/19812	12.50	13388	0	81
E-F	16:16:57.0 16:34:46.0	62832 76299	65000/19812	12.50	13213	0	255
G-H	16:36: 7.0 16:42: 5.0	77325 81832	65000/19812	12.50	4401	0	107
I-J	16:45:27.0 16:52:32.0	84382 89736	65000/19812	12.50	5201	0	154
K-L	16:55:15.0 17:00: 4.0	91784 95433	65000/19812	12.50	3401	1	248
M-N	17:05: 5.0 17:11:11.0	99227 103840	65000/19812	12.50	4501	0	113
O-P	17:14:13.0 17:20: 2.0	106132 110529	65000/19812	12.50	4301	0	97
Q-R	17:23:10.0 17:29: 0.0	112907 117314	65000/19812	12.50	4301	0	107
S-T	17:32:30.0 17:37: 7.0	119957 123448	65000/19812	12.50	3401	0	91
U-V	17:40: 0.0 17:45:42.0	125629 129949	65000/19812	12.50	4201	0	120
W-X	17:47: 5.0 17:52:56.0	130986 135417	65000/19812	12.50	4308	0	124
Y-Z	17:54:22.0 18:19:39.0	136500 155628	65000/19812	12.50	18386	0	743
1-2	18:19:39.0 18:44:56.0	155629 174757	65000/19812	12.50	18207	0	922

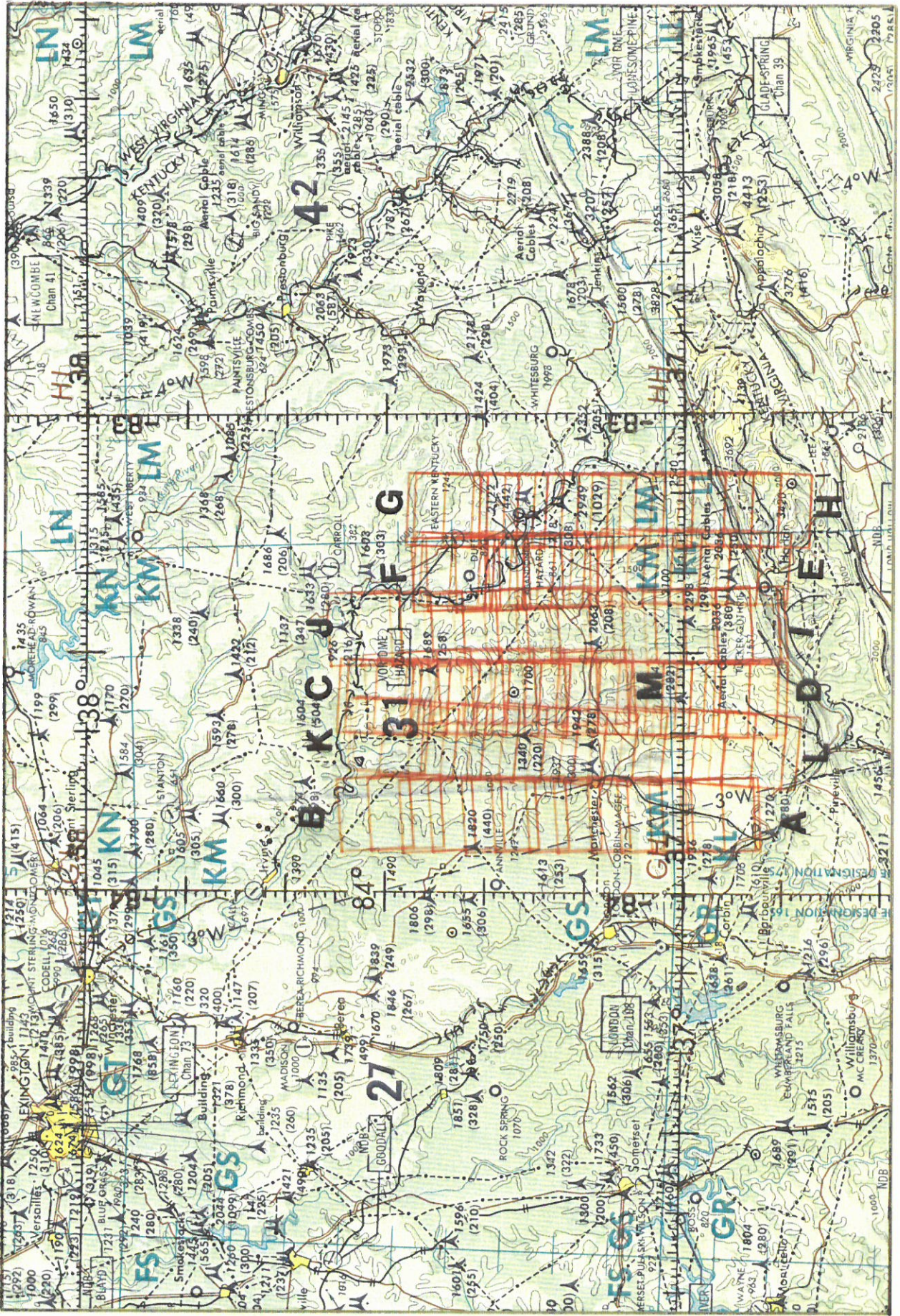


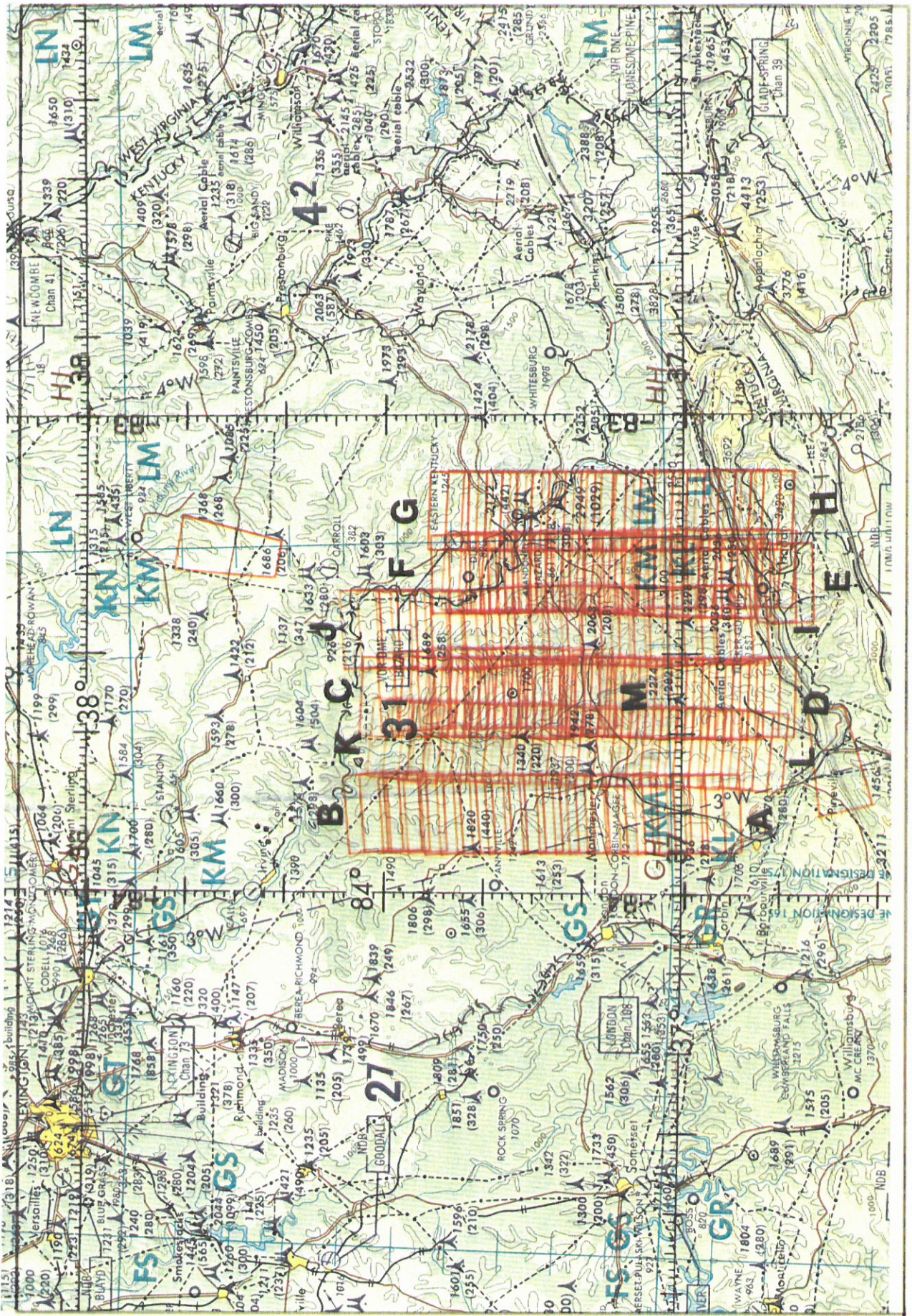
RC-10 / HR-732

A/C 709

8 Apr 11 1990

FLIGHT 90-070





FLIGHT SUMMARY REPORT

Flight #: 90-072
Date: 15 April 1990
Sensor Package: Wild-Heerbrug RC-10
Multispectral Atmospheric Mapping
Sensor (MAMS)
Area(s) Covered: Coastal Louisiana

Investigator(s): Menzel, University of Wisconsin
Flight Request: 90T232

Aircraft #: 709
Julian Date: 105

SENSOR DATA

Accession #:	04021	-----
Sensor ID #:	026	080
Sensor Type:	RC-10	MAMS
Focal Length:	12" 304.97 mm	-----
Film Type:	High Definition Aerochrome IR SO-131	-----
Filtration:	cc.10B	-----
Spectral Band:	510-900 nm	-----
f Stop:	4	-----
Shutter Speed:	1/150	-----
# of Frames:	209	-----
% Overlap:	60	-----
Quality:	Excellent	-----
Remarks:		

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Multispectral Atmospheric Mapping Sensor

The Multispectral Atmospheric Mapping Sensor (MAMS) is a modified Daedalus Scanner flown aboard the ER-2 aircraft. It is designed to study weather related phenomena including storm system structure, cloud-top temperatures, and upper atmosphere water vapor. The scanner retains the eight silicon-detector channels in the visible/near-infrared region found on the Daedalus Thematic Mapper Simulator, with the addition of four channels in the thermal infrared relating to specific water vapor features. The specific bands are as follows:

<u>Daedalus Channel</u>	<u>Wavelength, μm</u>
1	LSBs for Channels 9-12
2	0.45 - 0.52
3	0.52 - 0.60
4	0.57 - 0.67
5	0.60 - 0.73
6	0.65 - 0.83
7	0.72 - 0.99
8	0.83 - 1.05
9	3.55 - 3.93 low range
10	3.55 - 3.93 high range
11	10.3 - 12.1
12	12.5 - 12.8

Sensor specifications are as follows:

IFOV:	5.0 mrad
Pixel/Scan Line:	716
Total Scan Angle:	86 ^o
Scan Rate:	6.25 scans/second
Digitization:	8-bit Channels 2-8 10-bit Channels 9-12

The data will not be archived at EROS Data Center because this is an experimental system with low spatial resolution and unique spectral characteristics. As all scenes will be primarily cloud-covered there would be little terrestrial application for the data. Further information concerning the data can be obtained from principal investigator, Gregory S. Wilson, Atmospheric Effects Branch, George C. Marshall Space Flight Center, National Aeronautics and Space Administration, Marshall Space Flight Center, Alabama 35812-5001.

NOTE: Information on data tape format, logical record format, and scanner calibration data may be obtained from the NASA-Ames Aircraft Data Facility at (415) 604-6252 or FTS 464-6252.

CAMERA FLIGHT LINE DATA
FLIGHT NO. 90-072

Accession # 04021

Sensor # 026

Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
A - B	1603-1640	14:35:52	14:52:55	65000/19800	10-100% strato cumulus (frames 1603-1619)
C - D	1641-1676	14:57:27	15:13:11	"	10-90% strato cumulus (frames 1659-1676)
E - F	1677-1715	15:18:32	15:35:40	"	10-100% strato cumulus (frames 1677-1693); 10% minor cumulus (frames 1702-1704)
G - H	1716-1753	15:41:18	15:57:57	"	10-70% cumulus and strato cumulus (frames 1741-1753)
I - J	1754-1793	16:03:16	16:20:51	"	10-70% cumulus and strato cumulus (frames 1754-1766); 10% minor cumulus (frames 1772-1774 and 1777-1779)
K - L	1794-1811	16:27:53	16:35:19	"	Clear

