

FLIGHT SUMMARY REPORT

Flight #: 91-041
Date: 18 December 1990
Sensor Package: Wild-Heerbrug RC-10
Multispectral Atmospheric Mapping Sensor
(MAMS)
Thermatic Mapper Simulator (TMS)
Area(s) Covered: Central Valley, California
Sierra Nevada Mountains

Investigator(s): M. Ledbetter

Aircraft #: 708

Flight Request: 90R256

Julian Date: 352

SENSOR DATA

Accession #:	04176	----	----
Sensor ID #:	034	102	101
Sensor Type:	RC-10	MAMS	TMS
Focal Length:	12" 305.66 mm	----	----
Film Type:	High Definition Aerial IR SO-131	----	----
Filtration:	cc.10B	----	----
Spectral Band:	510-900 nm	----	----
f Stop:	4	----	----
Shutter Speed:	1/150	----	----
# of Frames:	203	----	----
% Overlap:	60	----	----
Quality:	Good	----	----
Remarks:	Low sun angle throughout the flight		

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 sensors used for data collection during this flight.

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
Ground Resolution:	325 feet (99 meters) at 65,000 feet
Total Scan Angle:	86°
Swath Width:	20 nmi (37 km) at 65,000 feet
Pixels/Scan Line:	716
Scan Rate:	6.25 scans/second
Ground Speed:	400 kts (206 m/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.

Thematic Mapper Simulator

The Daedalus Thematic Mapper Simulator (TMS) is a multispectral scanner flown aboard the ER-2 aircraft which simulates spatial and spectral characteristics of the seven Landsat-D Thematic Mapper bands. The specific bands are as follows:

<u>Daedalus Channel</u>	<u>TM Band</u>	<u>Wavelength, μm</u>
1	A	0.42 - 0.45
2	1	0.45 - 0.52
3	2	0.52 - 0.60
4	B	0.60 - 0.62
5	3	0.63 - 0.69
6	C	0.69 - 0.75
7	4	0.76 - 0.90
8	D	0.91 - 1.05
9	5	1.55 - 1.75
10	7	2.08 - 2.35
11	6	8.5 - 14.0 low gain
12	6	8.5 - 14.0 high gain

Sensor/aircraft parameters are as follows:

IFOV:	1.25 mrad
Ground Resolution:	81 feet (25 meters) at 65,000 feet
Total Scan Angle:	43°
Swath Width:	8.4 nmi (15.6 km) at 65,000 feet
Pixels/Scan Line:	716
Scan Rate:	12.5 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. 91-041

Accession # 04176

Sensor # 034

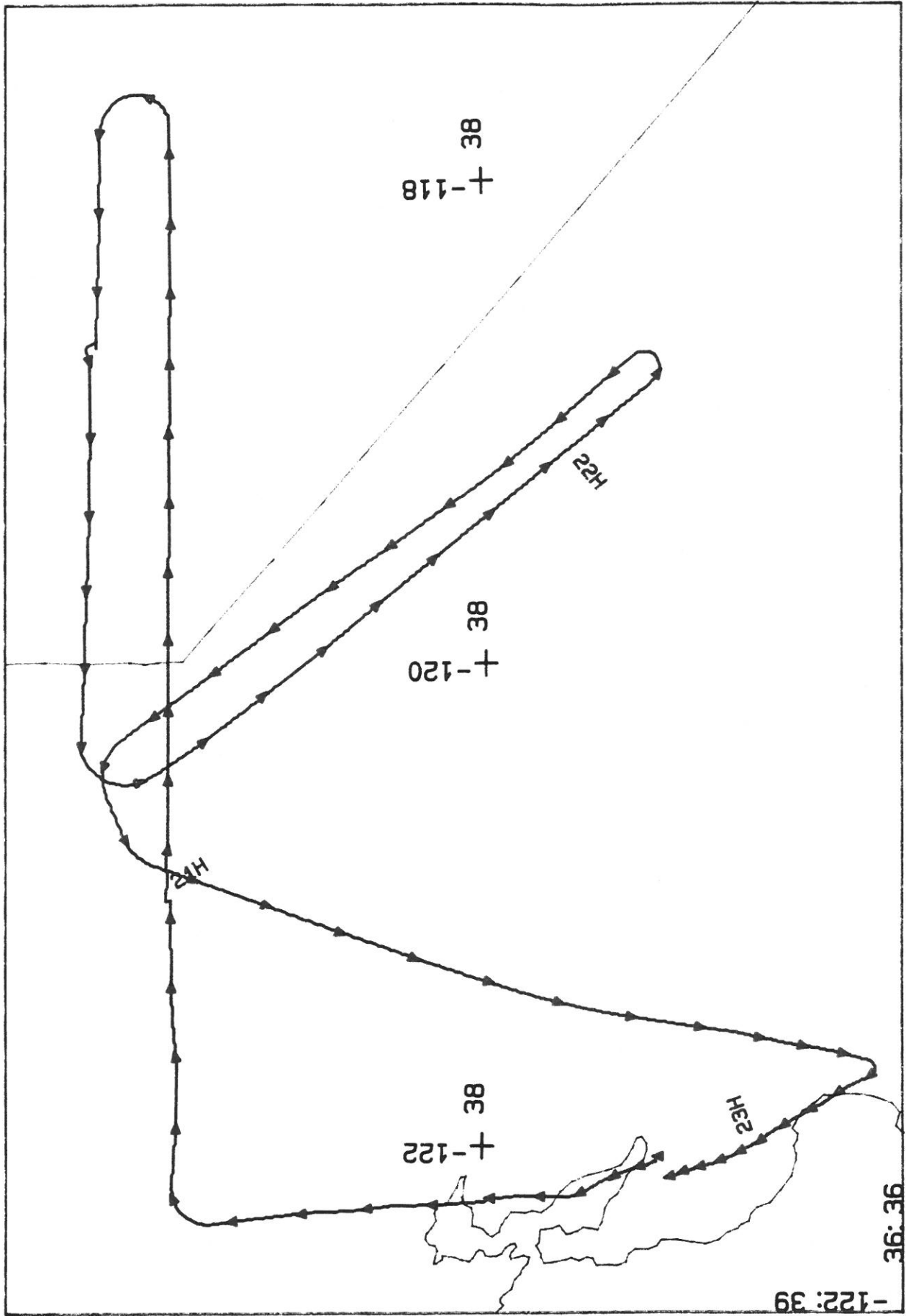
Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
A - B	2798-2862	20:51:52	21:22:21	65000/19800	10-100% cirro-cumulus (frames 2798-2807; 2816-2863)
C - D	2863-2896	21:26:27	21:42:01	"	60-100% cirro-cumulus
E - F	2897-2934	21:45:32	22:02:57	"	10-100% cumulus (frames 2897-2908); 10% cirrus (frames 2933-2934)
G - H	2935-2973	22:05:15	22:23:05	"	10-90% cirrus (frames 2935-2942); 10% cirrus (frame 2954); 10-80% cirro-cumulus (frames 2960-2973)
I - J	2974-2977	22:25:10	22:26:10	"	80-100% cirrus
J - K	2978-3000	22:27:49	22:38:05	"	10% cumulus (frame 2978); 10-70% cirro- cumulus (frames 2987-2994); thin cirrus (frames 2995-2999); 20% cumulus (frame 3000)

SCANNER FLIGHT LINE DATA

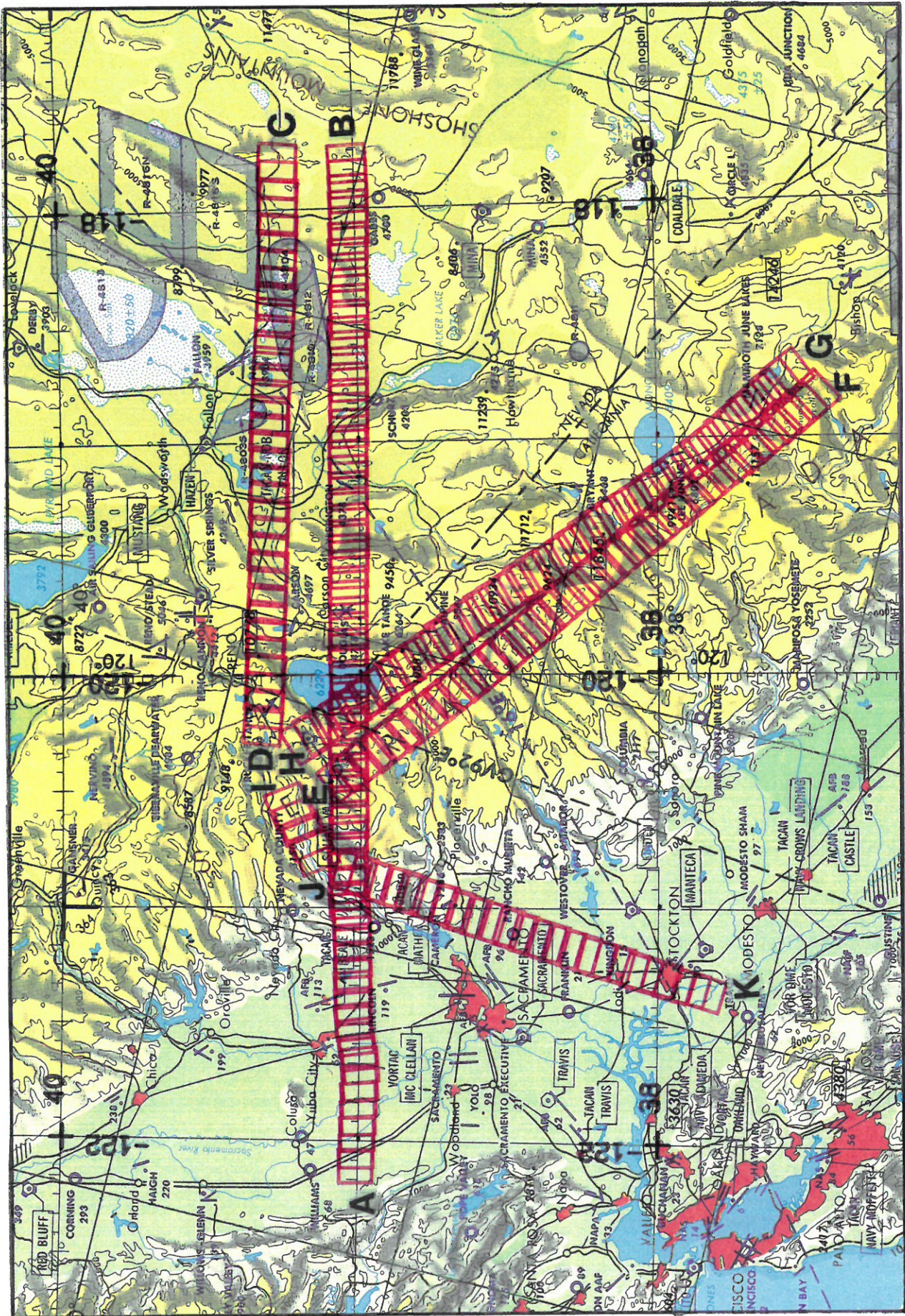
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PAEDALUS FLIGHT DATA
FLIGHT NUMBER: 91-041

Check Points	A c t u a l t i m e b e g i n	A c t u a l e n d	A c t u a l s c a n l i n e b e g i n	A c t u a l e n d	A l t i t u d e f e e t / m e t e r	S c a n 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	20:51:49.0	21:22:31.0	11311	22823	65000/19812	6.25	11501	0	12
C-D	21:26:16.0	21:42:3.0	24230	30150	65000/19812	6.25	5901	0	20
E-F	21:45:32.0	22:02:56.0	31452	37980	65000/19812	6.25	6502	0	27
G-H	22:05:7.0	22:23:9.0	38798	45559	65000/19812	6.25	6701	0	61
I-J	22:25:1.0	22:26:37.0	46259	46859	65000/19812	6.25	601	0	0
K-L	22:27:41.0	22:38:7.0	47259	51173	65000/19812	6.25	3901	0	14



FLIGHT 91-041 18 DECEMBER 1990 A/C 708 FUNCTIONAL CHECK FLIGHT
 OVERLAY FOR XCMUSA LAMBERT CONFORMAL PROJECTION: SP1 = 36.3 SP2 = 38.9 CM = -120.0 ROTATED BY 0.0
 20:30:00 TO 23:11:05 UT SCALE = 1:1.97E+06 TIME TICS EVERY 2.00 MINUTES



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