

# FLIGHT SUMMARY REPORT

**Flight #:** 90-067  
**Date:** 27 March 1990  
**Sensor Package:** Wild-Heerbrug RC-10  
Thematic Mapper Simulator (TMS)  
**Area(s) Covered:** Sierra Nevada Mountains, California

**Investigator(s):** Ledbetter, Lockheed  
**Flight Request:** 90R256

**Aircraft #:** 709  
**Julian Date:** 086

## SENSOR DATA

<b>Accession #:</b>	04009	----
<b>Sensor ID #:</b>	026	101
<b>Sensor Type:</b>	RC-10	TMS
<b>Focal Length:</b>	12" 304.97 mm	----
<b>Film Type:</b>	High Definition Aerochrome IR SO-131	----
<b>Filtration:</b>	cc.10B	----
<b>Spectral Band:</b>	510-900 nm	----
<b>f Stop:</b>	4	----
<b>Shutter Speed:</b>	1/150	----
<b># of Frames:</b>	170	----
<b>% Overlap:</b>	60	----
<b>Quality:</b>	Excellent	----
<b>Remarks:</b>	Heavy cloud cover throughout 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 sensor used for data collection during this flight.

### Thematic Mapper Simulator

The Daedalus Thematic Mapper Simulator (TMS) is a high altitude 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, <math>\mu m</math></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:	1.3 mr
Ground Resolution:	91 feet (28 meters at 70,000 feet)
Total Scan Angle:	43 <sup>o</sup>
Swath Width:	9.0 nmi (16.6 km at 70,000 feet)
Pixels/Scan Line:	716 (750 following rectification)
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. 90-067**

Accession # 04009

Sensor # 026

Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
A	0781	19:25:19	19:25:19	65000/19800	30% cumulus (frame 0781)
B - C	0782-0805	19:27:11	19:37:22	"	10-20% cumulus (frames 0782-0795 and 0797-0804)
D - E	0806-0816	19:40:55	19:45:17	"	10-60% cumulus (frames 0810-0816)
F - G	0817-0834	19:48:11	19:55:33	"	10-70% cumulus (frames 0817-0834)
G - H	0835-0841	19:56:42	19:58:45	"	10-60% cumulus (frames 0835-0841)
I - J	0842-0859	20:01:19	20:08:58	"	10-80% cumulus (frames 0842-0859)
J - K	0860-0870	20:09:26	20:14:09	"	Oblique (frame 0860); 10-80% cumulus (frames 0860-0870)
-----	0871	20:20:06	20:20:06	"	50% cumulus; oblique frame
L - N	0872-0882	20:20:53	20:25:11	"	10-50% cumulus (frames 0872-0882)
O - P	0883-0888	20:27:26	20:29:24	"	10-40% cumulus (frames 0883-0888)

**CAMERA FLIGHT LINE DATA  
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Accession # 04009

Sensor # 026

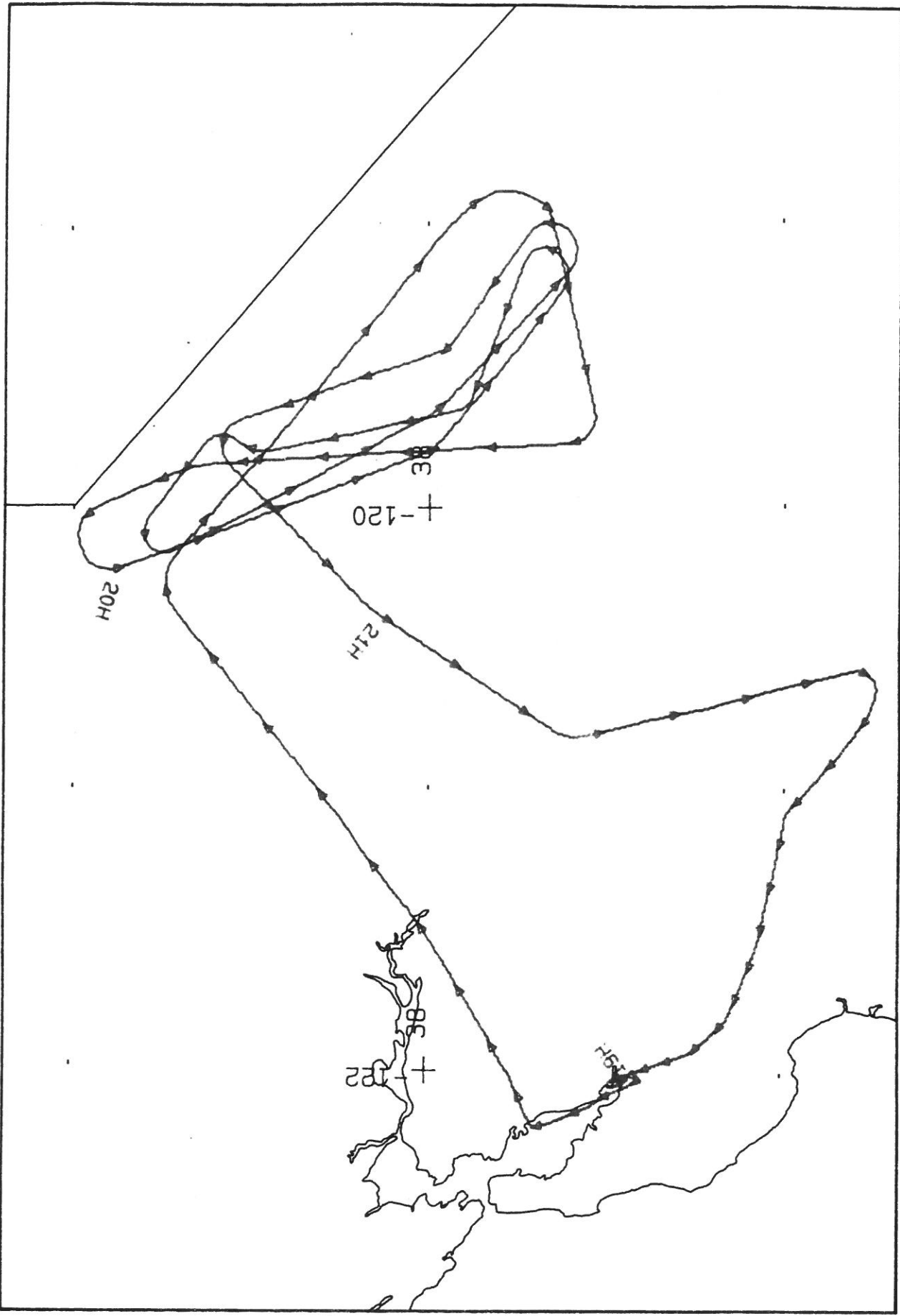
Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
B - S	0889-0917	20:31:17	20:43:07	65000/19800	10-90% cumulus (frames 0889-0917)
-----	0918-0921	20:43:35	20:44:59	"	0-10% cumulus (frames 0918-0921); oblique frames in turn
S - T	0922-0941	20:45:27	20:53:58	"	10-30% cumulus (frames 0922-0929); 10-90% cumulus (frames 0930-0941)
U - V	0942-0950	20:55:48	20:59:09	"	10-80% cumulus (frames 0942-0950)

# TMS SCANNER FLIGHT LINE DATA

## FLIGHT NO. 90-067

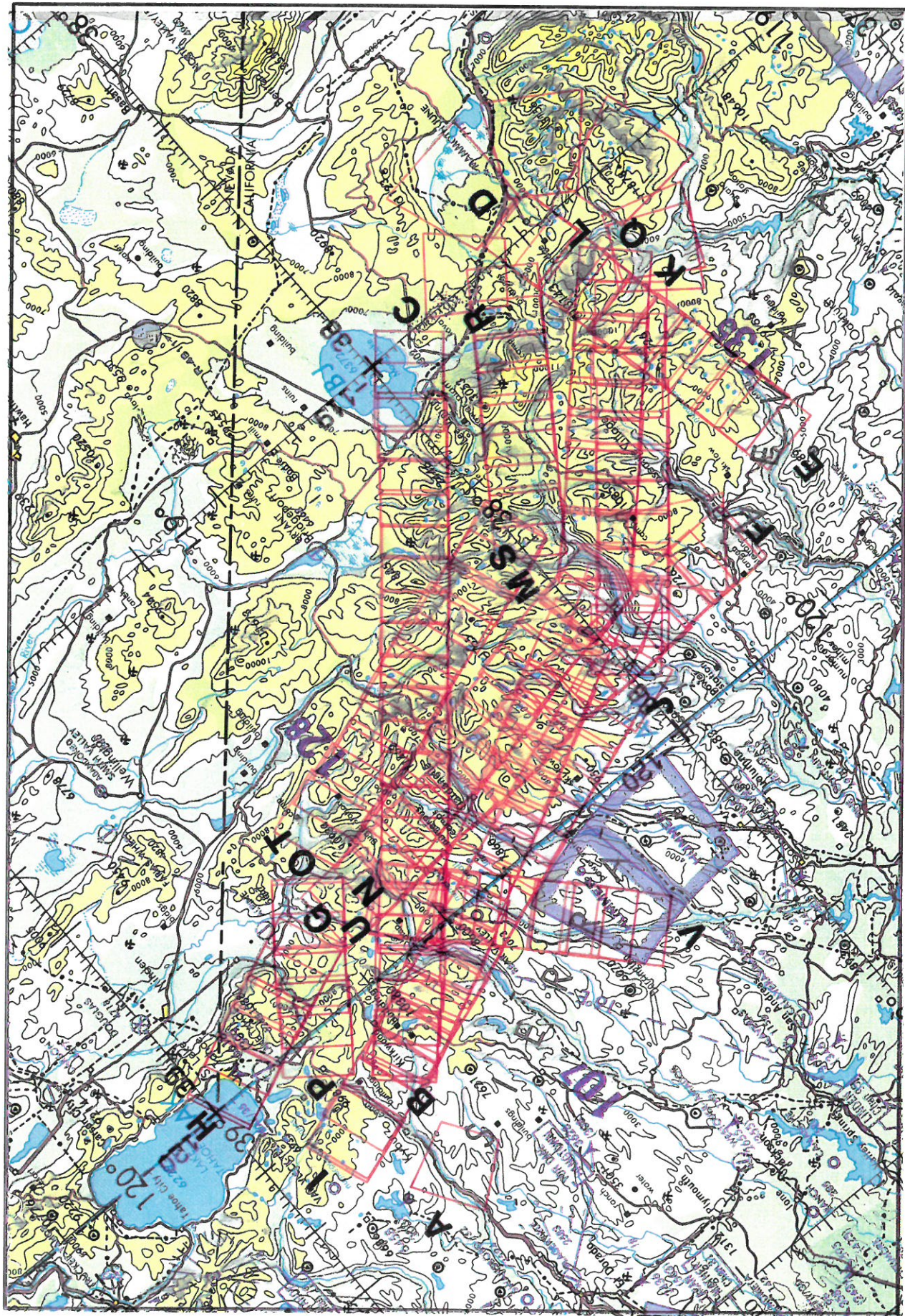
DAEDALUS FLIGHT DATA  
FLIGHT NUMBER: 90-067

Check Points	A c t u a l t i m e b e g i n e n d (GMT)	A c t u a l s c a n l i n e b e g i n e n d	A l t i t u d e f e e t / m e t e r	Scan S p e e d (rps)	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
B-C	19:26:46.0 19:36:26.0	27286 34576	65000/19812	12.50	7057	0	234
D-E	19:39:56.0 19:44:40.0	37216 40797	65000/19812	12.50	3517	0	65
F-G	19:47:11.0 19:54:39.0	42700 48345	65000/19812	12.50	5491	0	155
G-H	19:55:43.0 19:57:51.0	49146 50762	65000/19812	12.50	1555	0	62
I-K	20:00:21.0 20:13:21.0	52647 62485	65000/19812	12.50	9105	0	734
L-N	20:19:55.0 20:24:24.0	67450 70845	65000/19812	12.50	3200	0	196
O-P	20:26:27.0 20:28:30.0	72402 73953	65000/19812	12.50	1465	0	87
B-Q	20:30:19.0 20:37:5.0	75325 80451	65000/19812	12.50	4742	0	385
R-S	20:37:51.0 20:41:59.0	81029 84167	65000/19812	12.50	2794	0	345
S-T	20:44:52.0 20:53:16.0	86353 92718	65000/19812	12.50	5272	0	1094
U-V	20:54:49.0 20:58:13.0	93892 96468	65000/19812	12.50	2245	0	332



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FLIGHT 90-067

27 March 1990

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Accession # 04009

CNC 6-18