

# FLIGHT SUMMARY REPORT

**Flight #:** 91-157  
**Date:** 29 August 1991  
**Sensor Package:** Dual Wild-Heerbrug RC-10  
Thematic Mapper Simulator (TMS)  
**Area(s) Covered:** Central Valley, California

**Investigator(s):** Craddock, State of California DWR  
**Flight Request:** 91R106

**Aircraft #:** 709  
**Julian Date:** 241

## SENSOR DATA

<b>Accession #:</b>	04291	04292	-----
<b>Sensor ID #:</b>	036	033	101
<b>Sensor Type:</b>	RC-10	RC-10	TMS
<b>Focal Length:</b>	6" 153.19 mm	6" 153.17 mm	-----
<b>Film Type:</b>	High Definition Aerochrome IR SO-131	Aerial Color SO-242	-----
<b>Filtration:</b>	cc.20B	2.2AV	-----
<b>Spectral Band:</b>	510-900 nm	400-700 nm	-----
<b>f Stop:</b>	4	4	-----
<b>Shutter Speed:</b>	1/75	1/100	-----
<b># of Frames:</b>	279	281	-----
<b>% Overlap:</b>	60	60	-----
<b>Quality:</b>	Excellent	Excellent	-----
<b>Remarks:</b>			

## 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 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:

I FOV:	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. 91-157**

Accession # 04292

Sensor # 033

Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
A - B	9196-9223	17:34:30	17:56:23	65000/19800	Clear
C - D	9224-9238	18:05:11	18:18:25	"	10-30% cirrus (frames 9234-9238)
E - F	9239-9293	18:26:34	19:17:36	"	10-20% cirrus (frames 9245-9250); 10% cumulus (frames 9289-9293)
G - H	9294-9351	19:20:57	20:14:55	"	10-30% cirrus (frames 9334-9337); 10% (frames 9345-9351)
I - J	9352-9411	20:20:13	21:16:01	"	10-20% cirrus (frames 9352-9364, 9368-9369, 9372-9375); 10% cumulus (frame 9411)
K - L	9412-9476	21:21:04	22:20:38	"	10-30% cirrus (frames 9448-9453); processing residue (frame 9454); 10-20% cirrus (frames 9455-9476)

**CAMERA FLIGHT LINE DATA  
FLIGHT NO. 91-157**

Accession # 04291

Sensor # 036

Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
A - B	8854-8879	17:34:30	17:56:24	65000/19800	Clear
C - D	8880-8894	18:05:11	18:18:25	"	30% thin cumulus (frames 8892-8894)
E - F	8895-8949	18:26:39	19:17:37	"	10-20% thin cumulus (frames 8903-8906); 10% cumulus (frames 8945-8949)
G - H	8950-9007	19:20:56	20:14:56	"	20-40% thin cumulus (frames 8990-8992)
I - J	9008-9067	20:20:14	21:16:01	"	30% thin cumulus (frames 9013-9018); 10% thin cumulus (frames 9024-9025); 20% thin cumulus (frames 9028-9031)
K - L	9068-9132	21:21:04	22:20:38	"	20-40% thin cumulus (frames 9104-9105, 9108-9109); 40-60% thin cirrus (frames 9122-9131)

# TMS SCANNER FLIGHT LINE DATA

## FLIGHT NO. 91-157

DAEDALUS FLIGHT DATA  
FLIGHT NUMBER: 91-157

Check Points	Actual Time (GMT)		Actual Scanline		Altitude feet/meter	Scan Speed (rps)	Total Good Scanlines	Total Interpolated Scanlines	Total Repeated Scanlines
	Begin	End	Begin	End					
A-B	17:37:12.0	17:39:32.0	18689	20448	65000/19812	12.50	1623	0	137
C-D	17:40:49.0	17:43:30.0	21402	23415	65000/19812	12.50	2012	0	2
E-F	17:48:41.0	17:49:20.0	27307	27794	65000/19812	12.50	488	0	0
G-H	17:53:22.0	17:54:12.0	30816	31449	65000/19812	12.50	634	0	0
I-J	18:05:11.0	18:06:17.0	39681	40511	65000/19812	12.50	831	0	0
K-L	18:07:43.0	18:11:05.0	41590	44111	65000/19812	12.50	2518	0	4
M-N	18:12:56.0	18:13:29.0	45505	45909	65000/19812	12.50	405	0	0
O-P	18:26:34.0	18:27:44.0	55721	56597	65000/19812	12.50	867	0	10
Q-R	18:28:28.0	18:30:03.0	57154	58346	65000/19812	12.50	1193	0	0
S-T	18:39:49.0	18:44:04.0	65671	68848	65000/19812	12.50	3174	0	4
U-V	18:53:46.0	18:54:54.0	76126	76983	65000/19812	12.50	858	0	0
W-X	19:04:54.0	19:05:12.0	84478	84708	65000/19812	12.50	231	0	0
Y-Z	19:08:33.0	19:09:53.0	87216	88214	65000/19812	12.50	999	0	0
a-b	19:20:57.0	19:24:07.0	96512	98898	65000/19812	12.50	2385	0	2
c-d	19:36:38.0	19:39:11.0	108279	110196	65000/19812	12.50	1916	0	2
e-f	20:09:39.0	20:11:57.0	133043	134774	65000/19812	12.50	1732	0	0
g-h	20:20:15.0	20:21:25.0	140994	141865	65000/19812	12.50	840	0	2
i-j	20:22:28.0	20:23:44.0	142661	143604	65000/19812	12.50	944	0	0
k-l	20:29:39.0	20:30:42.0	148043	148826	65000/19812	12.50	784	0	0
m-n	20:48:47.0	20:49:16.0	162391	162762	65000/19812	12.50	372	0	0
o-p	20:55:33.0	20:58:32.0	167471	169712	65000/19812	12.50	2191	0	51

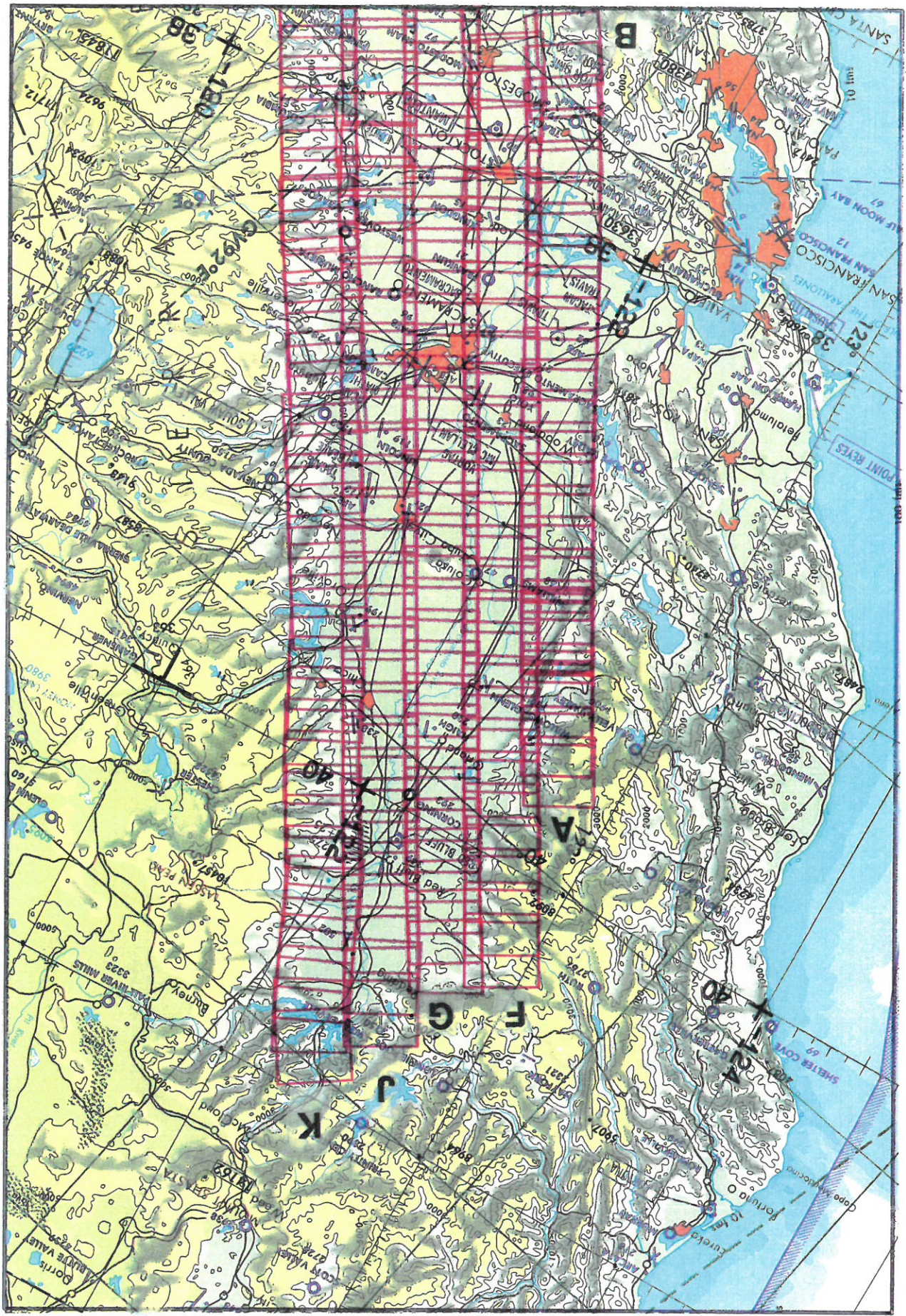
# TMS SCANNER FLIGHT LINE DATA

## FLIGHT NO. 91-157

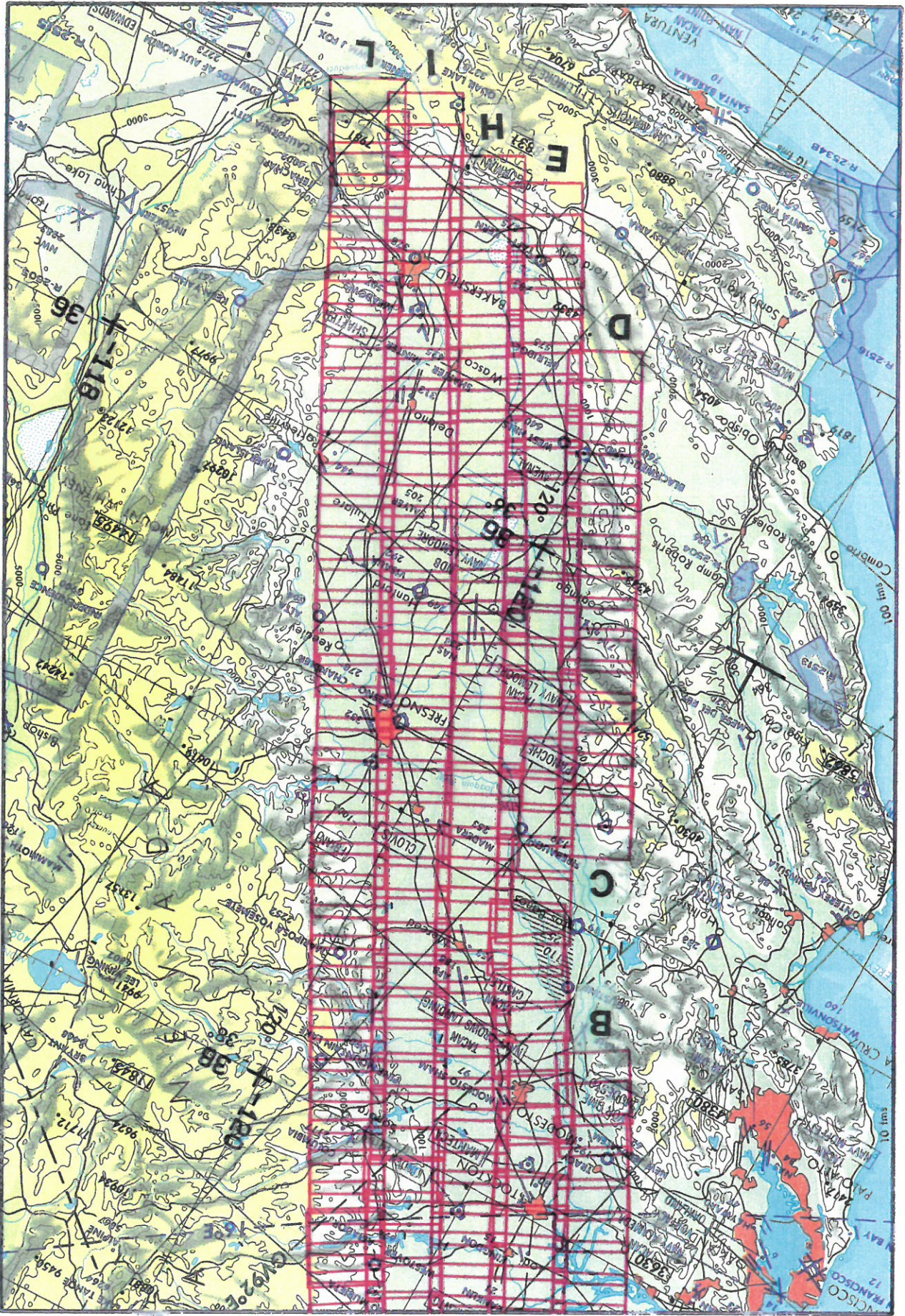
DAEDALUS FLIGHT DATA  
FLIGHT NUMBER: 91-157

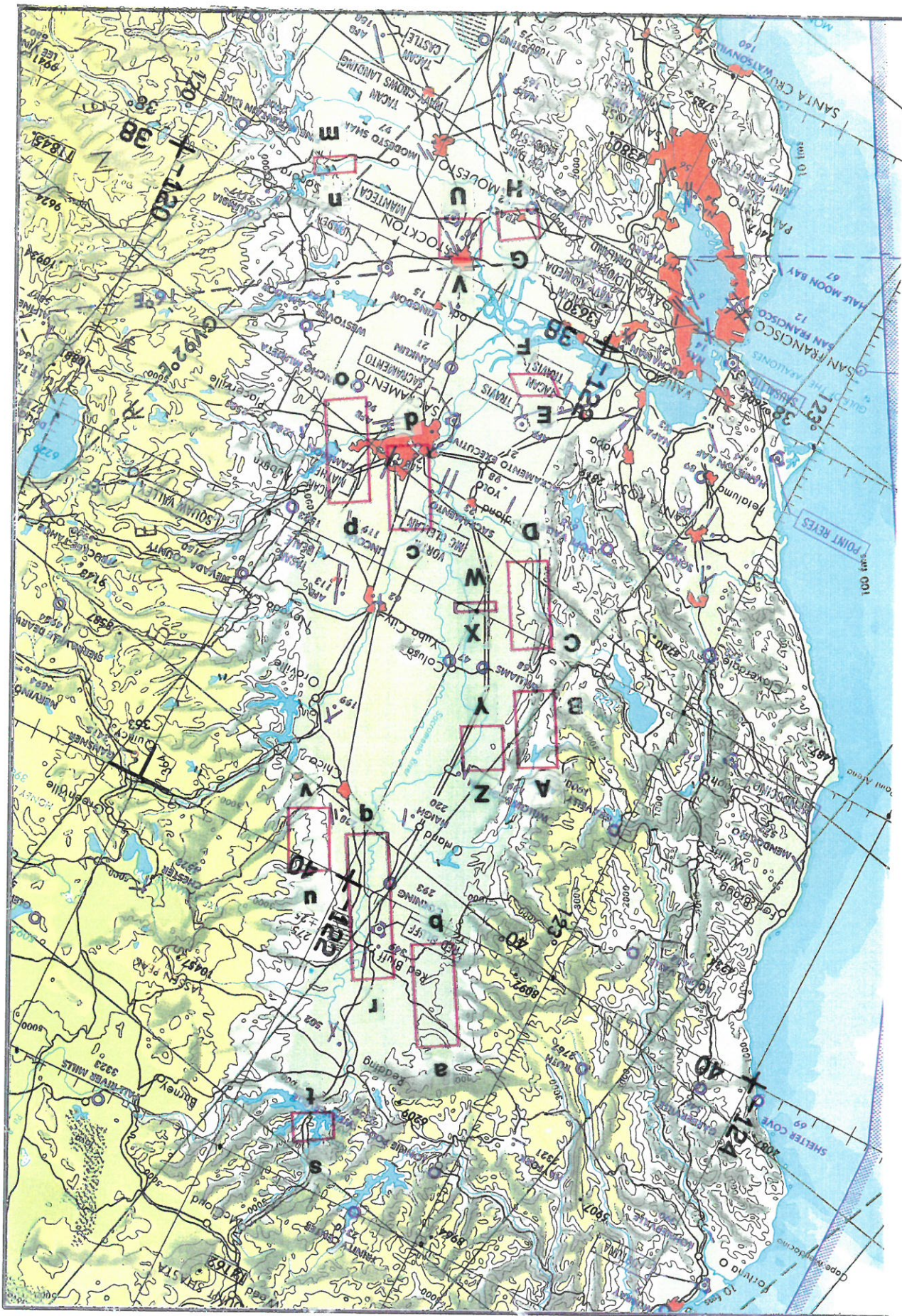
Check Points	Actual Time (GMT)		Actual Scanline		Altitude feet/meter	Scan Speed (rps)	Total Good Scanlines	Total Interpolated Scanlines	Total Repeated Scanlines
	Begin	End	Begin	End					
q-r	21:08:09.0	21:12:32.0	176921	180213	65000/19812	12.50	3283	0	10
s-t	21:21:05.0	21:21:54.0	186619	187236	65000/19812	12.50	618	0	0
u-v	21:29:19.0	21:31:15.0	192798	194244	65000/19812	12.50	1447	0	0













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28 August 1991

A/C 709

Thematic Mapper Simulator

JNC 49