

# FLIGHT SUMMARY REPORT

**Flight #:** 91-091  
**Date:** 20 May 1991  
**Sensor Package:** Wild-Heerbrug RC-10  
Airborne Visible and Infrared Imaging  
Spectrometer (AVIRIS)  
Thematic Mapper Simulator (TMS)  
**Area(s) Covered:** Utah

**Investigator(s):** Clark, USGS  
**Flight Request:** 91L241

**Aircraft #:** 706  
**Julian Date:** 140

## SENSOR DATA

<b>Accession #:</b>	04222	-----	-----
<b>Sensor ID #:</b>	033	099	101
<b>Sensor Type:</b>	RC-10	AVIRIS	TMS
<b>Focal Length:</b>	6" 153.17 mm	-----	-----
<b>Film Type:</b>	High Definition Aerochrome IR SO131	-----	-----
<b>Filtration:</b>	cc.10B	-----	-----
<b>Spectral Band:</b>	510-900 nm	-----	-----
<b>f Stop:</b>	4	-----	-----
<b>Shutter Speed:</b>	1/100	-----	-----
<b># of Frames:</b>	19	-----	-----
<b>% Overlap:</b>	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.

## Airborne Visible and Infrared Imaging Spectrometer

The Airborne Visible and Infrared Imaging Spectrometer (AVIRIS) is the second in the series of imaging spectrometer instruments developed at the Jet Propulsion Laboratory (JPL) for earth remote sensing. This instrument uses scanning optics and four spectrometers to image a 614 pixel swath simultaneously in 224 contiguous spectral bands (0.4-2.4  $\mu\text{m}$ ).

AVIRIS parameters are as follows:

IFOV:	1 mrad
Ground Resolution:	66 feet (20 meters) at 65,000 feet
Total Scan Angle:	30°
Swath Width:	5.7 nmi (10.6 km) at 65,000 feet
Spectral Coverage:	0.41-2.45 $\mu\text{m}$
Pixels/Scan Line:	614
Number of Spectral Bands:	224
Digitization:	10-bits
Data Rate:	17 MBPS

<u>Spectrometer</u>	<u>Wavelength Range</u>	<u>Number of Bands</u>	<u>Sampling Interval</u>
1	0.41 - 0.70 $\mu\text{m}$	31	9.4 nm
2	0.68 - 1.27 $\mu\text{m}$	63	9.4 nm
3	1.25 - 1.86 $\mu\text{m}$	63	9.7 nm
4	1.84 - 2.45 $\mu\text{m}$	63	9.7 nm

All AVIRIS data is decommutated and archived at JPL and not currently available for public distribution. For further information contact Rob Green at Jet Propulsion Laboratory, 4800 Oak Grove Drive, Mail Stop 183-501, Pasadena, California 91109-8099.

### 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\text{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:	1.25 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. 91-091**

Accession # 04222

Sensor # 033

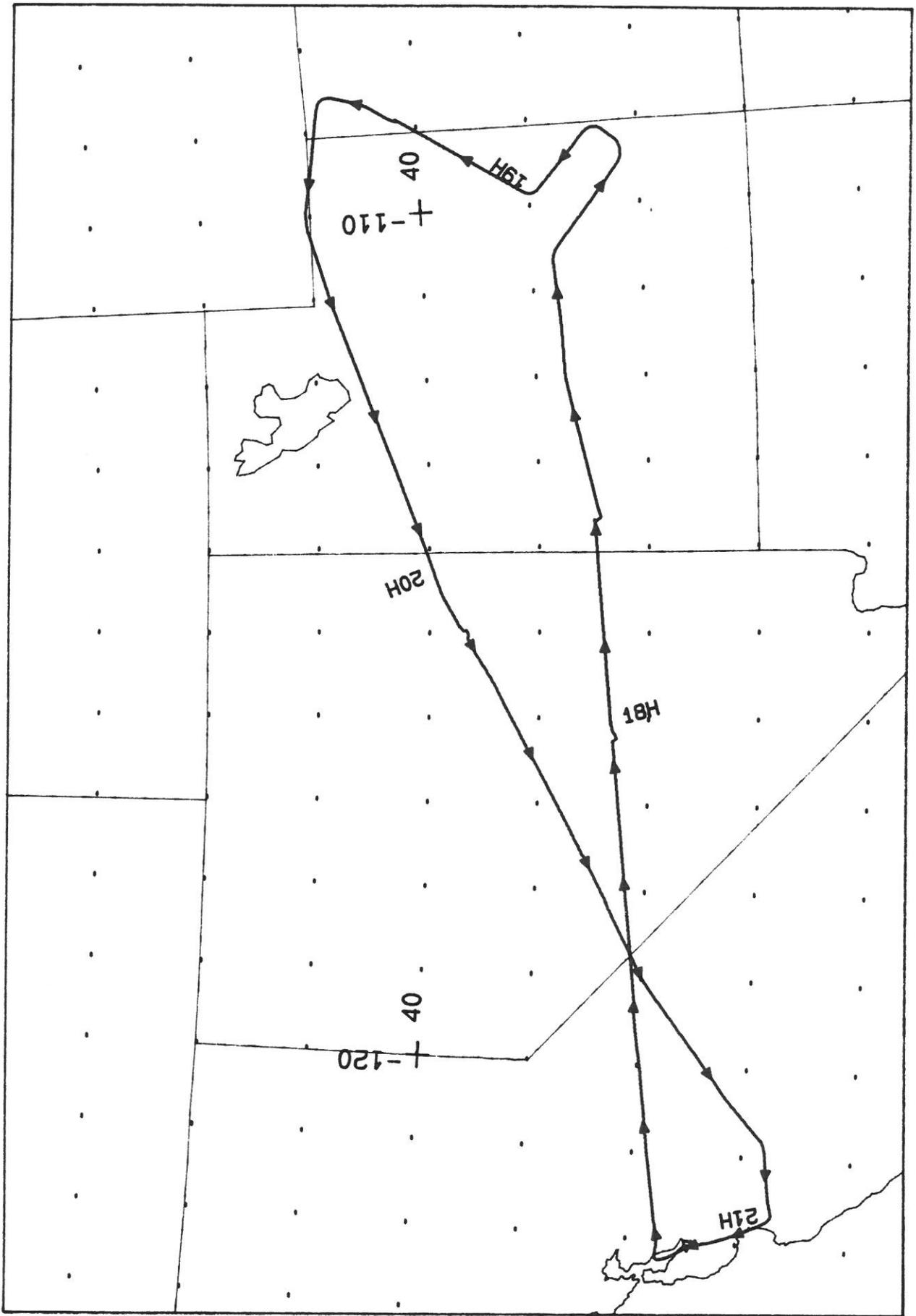
Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
A - B	5219-5223	18:43:04	18:46:42	65000/19800	Clear
C - D	5224-5229	18:56:04	18:59:46	"	10% cumulus (frames 5224-5227)
E - F	5230-5237	19:20:58	19:26:28	"	10% cumulus (frames 5230-5233)

# SCANNER FLIGHT LINE DATA

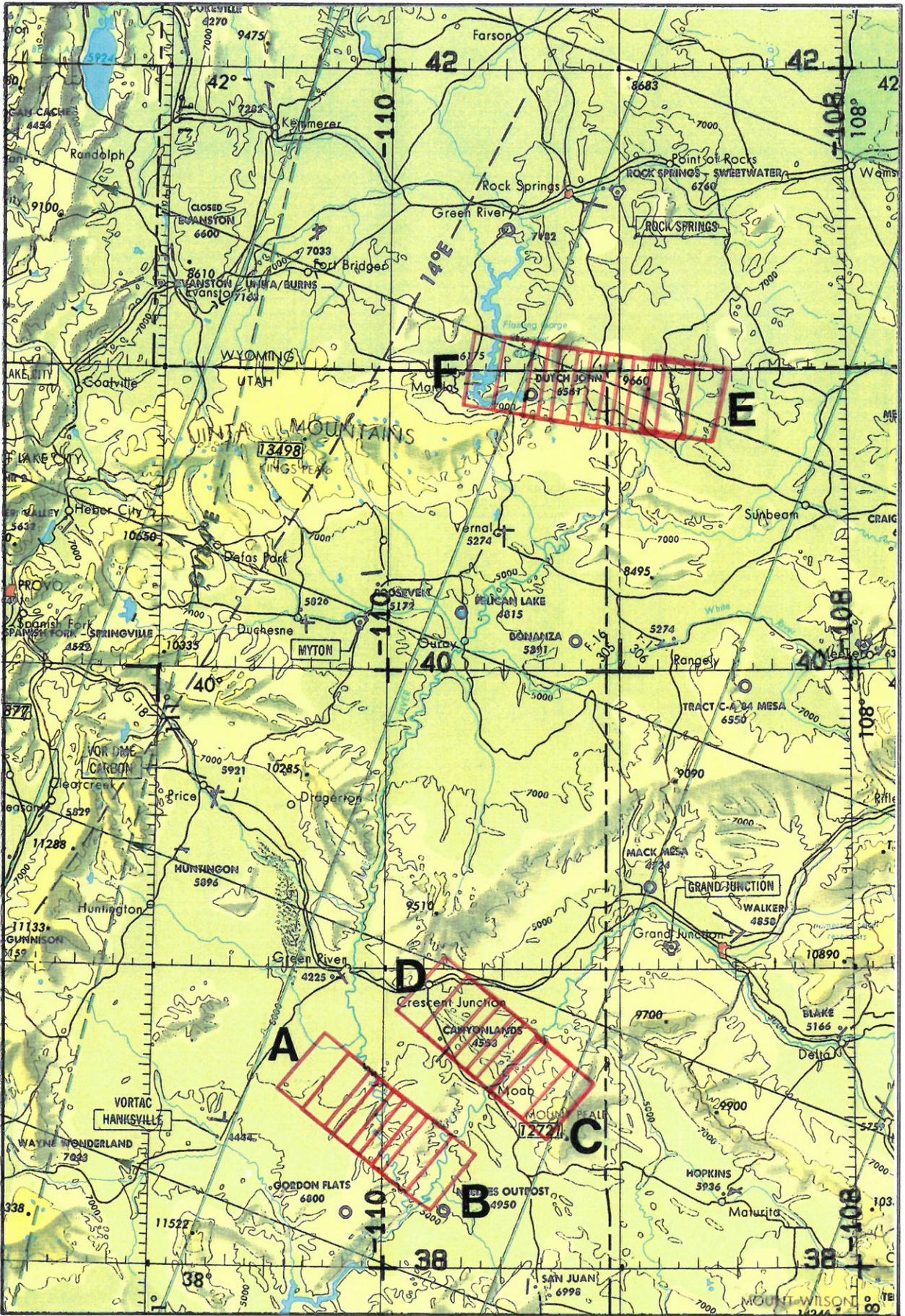
## FLIGHT NO. 91-091

DAEDALUS FLIGHT DATA  
FLIGHT NUMBER: 91-091

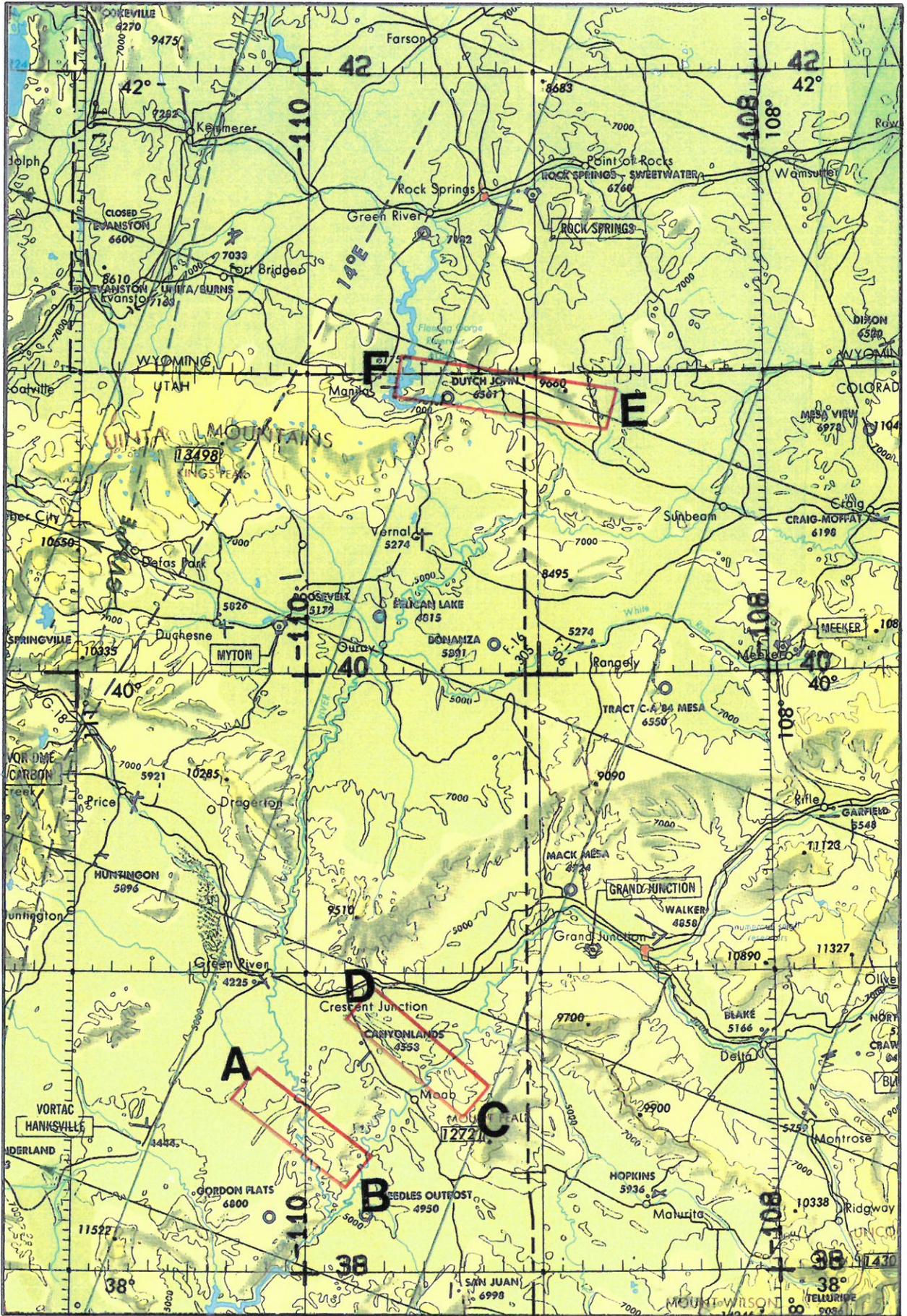
Check Points	Actual Time (GMT)		Actual Scanline		Altitude feet/meter	Scan Speed (rps)	Total Good Scanlines	Total Interpolated Scanlines	Total Repeated Scanlines
	Begin	End	Begin	End					
A-B	18:42:30	18:46:50	85286	86617	65000/19812	12.50	1319	0	13
C-D	18:55:30	19:00:00	93528	96514	65000/19812	12.50	2982	0	5
E-F	19:20:30	19:27:00	112361	116831	65000/19812	12.50	4469	0	2



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JNC 43

TMS Coverage

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