

# FLIGHT SUMMARY REPORT

**Flight #:** 90-129  
**Date:** 13 August 1990  
**Sensor Package:** Wild-Heerbrug RC-10  
Airborne Visible and Infrared Imaging  
Spectrometer (AVIRIS)  
Thematic Mapper Simulator (TMS)  
**Area(s) Covered:** Northern California and Oregon

**Investigator(s):** Spanner, TGS Technology, Inc.

**Aircraft #:** 706

**Flight Request:** 90L223D

**Julian Date:** 225

## SENSOR DATA

<b>Accession #:</b>	04094	----	----
<b>Sensor ID #:</b>	031	099	101
<b>Sensor Type:</b>	RC-10	AVIRIS	TMS
<b>Focal Length:</b>	6" 153.05 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>	1/100	----	----
<b># of Frames:</b>	40	----	----
<b>% Overlap:</b>	60	----	----
<b>Quality:</b>	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 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. 90-129**

Accession # 04094

Sensor # 031

Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
A - B	2584-2587	19:37:14	19:39:36	65000/19800	Clear
C - D	2588-2591	19:45:40	19:48:07	"	Clear
E - F	2592-2595	19:55:45	19:58:35	"	Minor cumulus (frames 2592-2593)
G - H	2596-2599	20:07:55	20:10:19	"	30-70% strato cumulus
I - J	2600-2602	20:49:14	20:51:06	"	20-50% strato cumulus (frames 2600-2601)
K - L	2603-2606	20:59:01	21:01:49	"	Minor-30% strato cumulus (frames 2605-2606)
M - N	2607-2610	21:12:02	21:14:49	"	30-50% strato cumulus (frames 2607-2608)
O - P	2611-2612	21:25:07	21:26:03	"	Smoke obstruction
Q - R	2613-2617	21:35:37	21:39:19	"	Smoke obstruction
S - T	2618-2623	21:46:13	21:50:51	"	Smoke obstruction

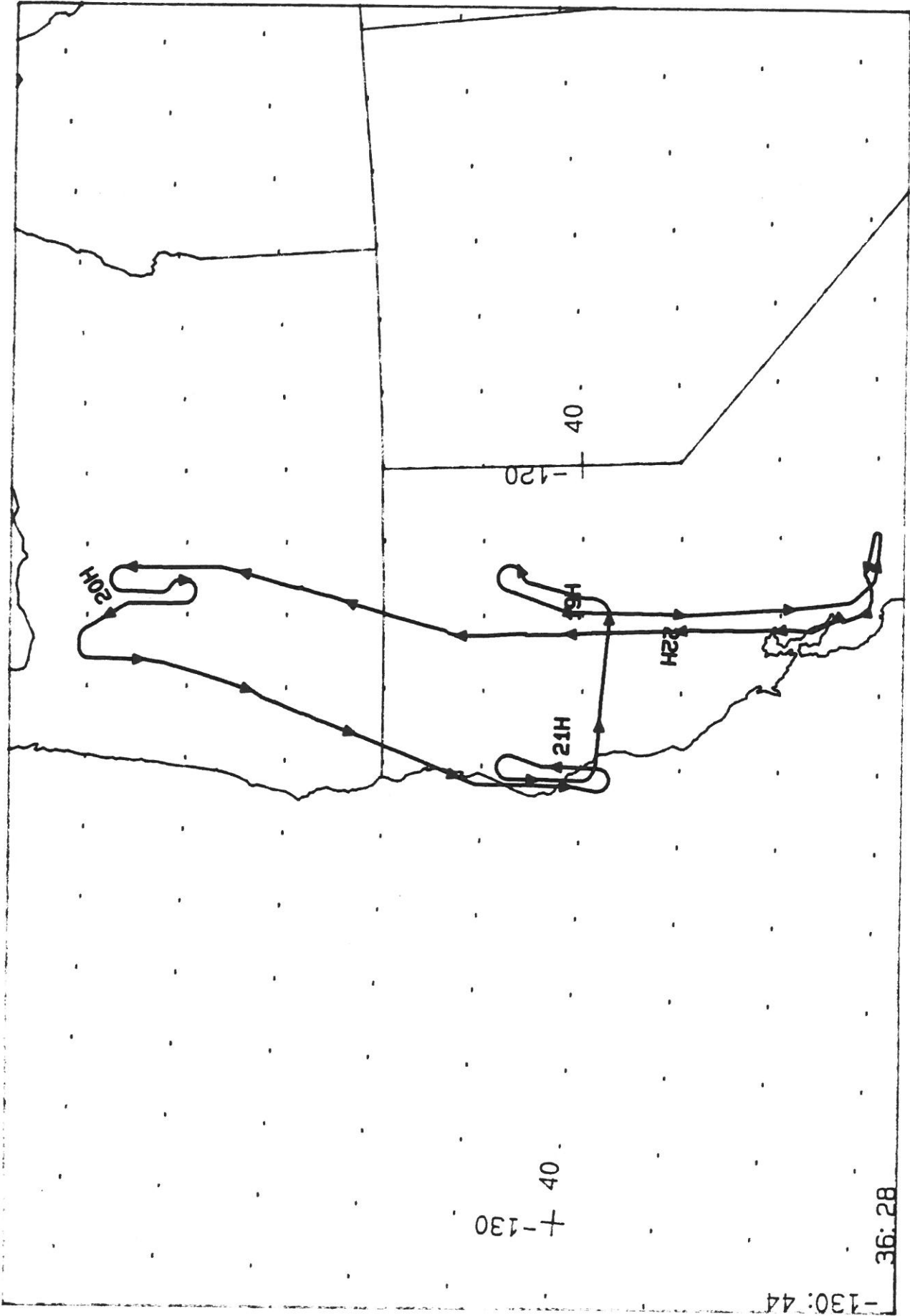
# SCANNER FLIGHT LINE DATA

FLIGHT NO. 90-129

DAEDALUS FLIGHT DATA  
FLIGHT NUMBER: 90-129

Check Points	A c t u a l t i m e b e g i n	(GMT) e n d	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	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	12:36:56.0	12:39:20.0	64400	65871	65000/19812	12.50	1468	0	4
C-D	12:45:22.0	12:48:1.0	69580	71210	65000/19812	12.50	1629	0	2
E-F	12:55:26.0	12:58:18.0	75769	77523	65000/19812	12.50	1753	0	2
G-H	13:07:37.0	13:10:11.0	83249	84830	65000/19812	12.50	1582	0	0
I-J	13:48:56.0	13:51:15.0	108644	110065	65000/19812	12.50	1420	0	2
K-L	13:58:44.0	14:02:1.0	114661	116682	65000/19812	12.50	2020	0	2
M-N	14:11:44.0	14:15:12.0	122653	124791	65000/19812	12.50	2135	0	4
O-P	14:24:53.0	14:25:58.0	130739	131412	65000/19812	12.50	674	0	0
Q-R	14:35:17.0	14:39:31.0	137135	139742	65000/19812	12.50	2598	0	10
S-T	14:45:48.0	14:50:33.0	143602	146520	65000/19812	12.50	2909	0	10

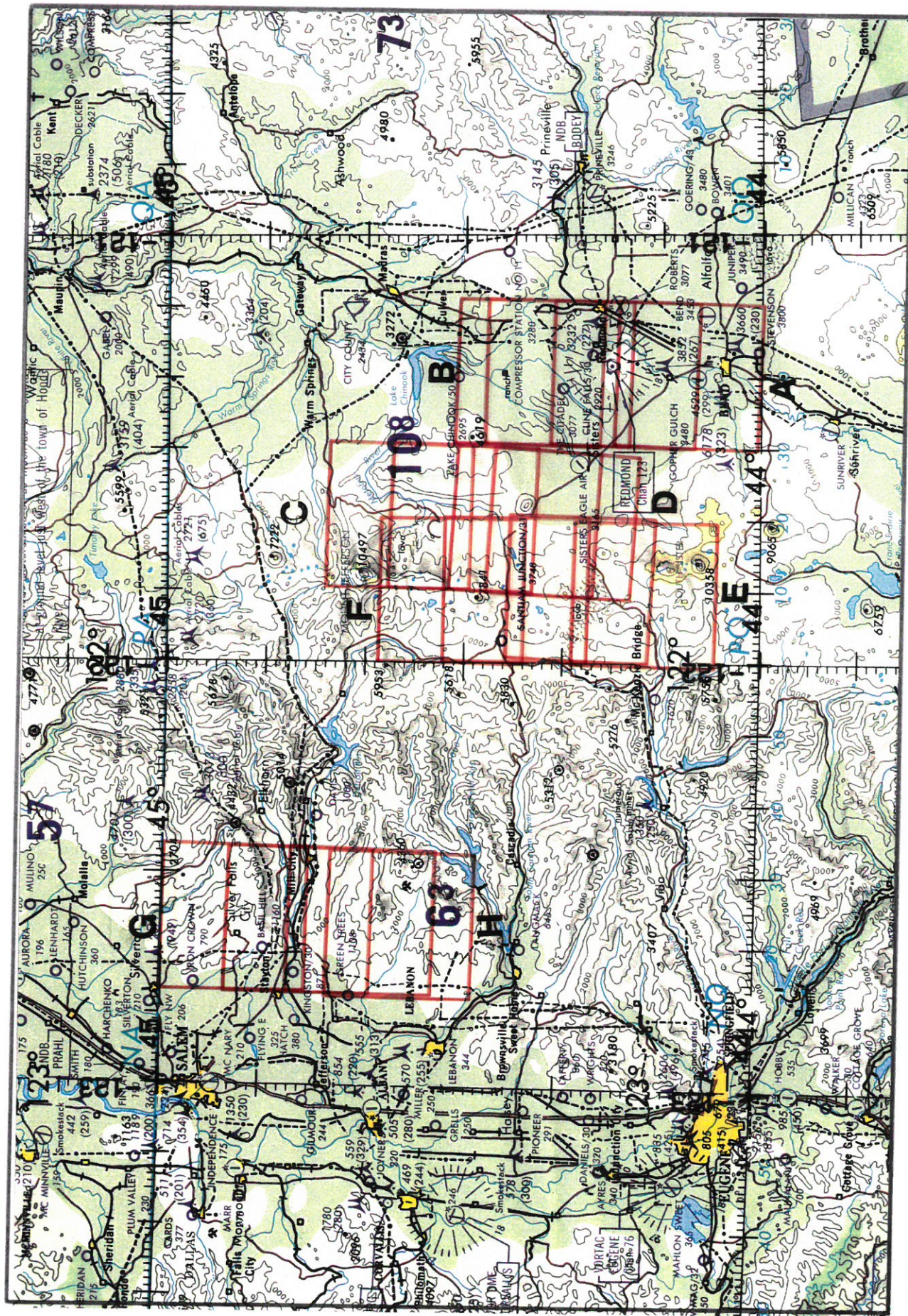
TIME LISTED ARE PDT -- ADD 7 HOURS FOR CORRECT GMT

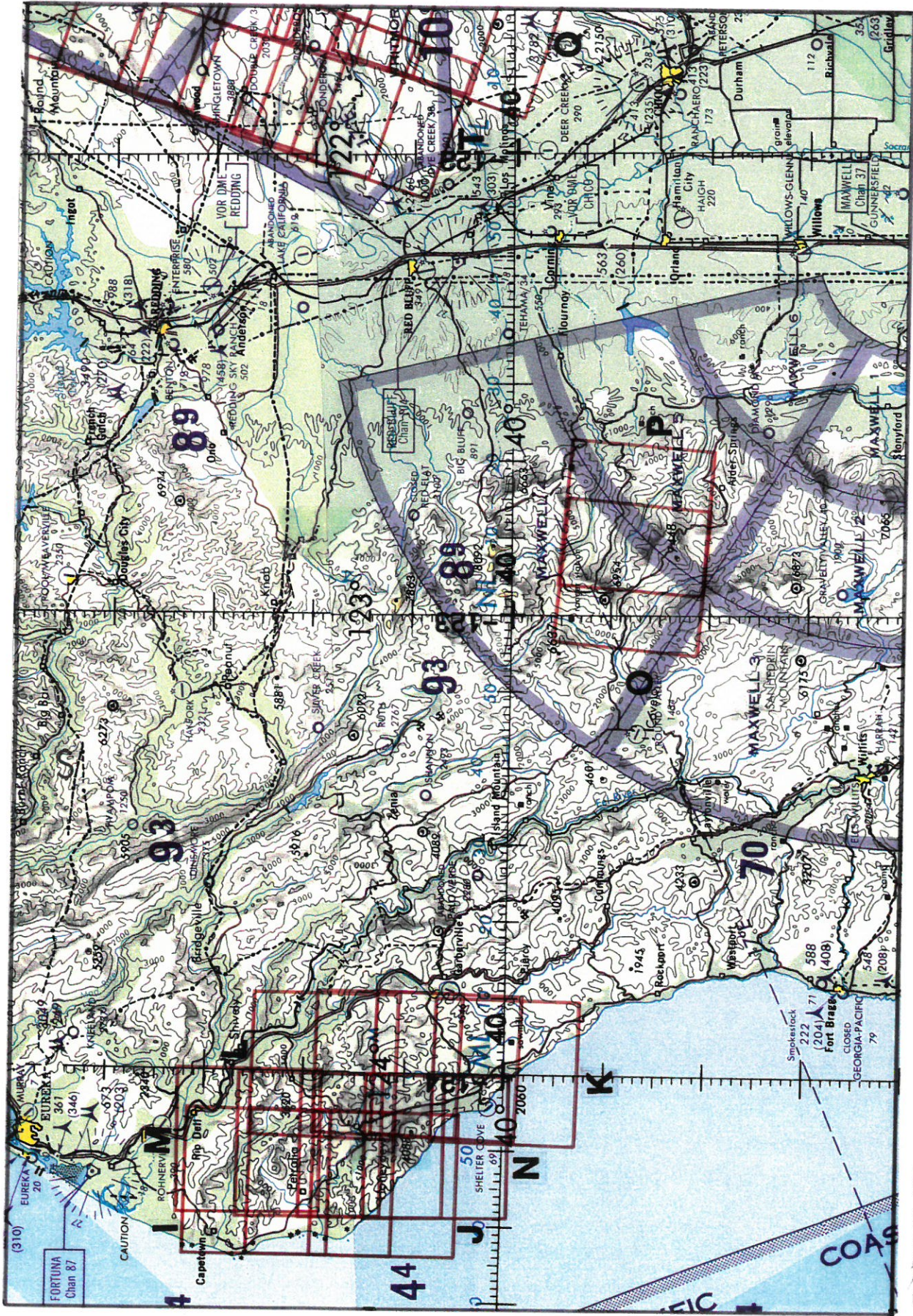


FLIGHT 90-129

OVERLAY FOR XCHUSA LAMBERT CONFORMAL PROJECTION: SP1 = 35.6 SP2 = 43.7 CM = -122.6 ROTATED BY 0.0

18:30:35 TO 22:50:40 UT SCALE = 1:6.05E+06 TIME TICS EVERY 10.00 MINUTES





FLIGHT 90-129

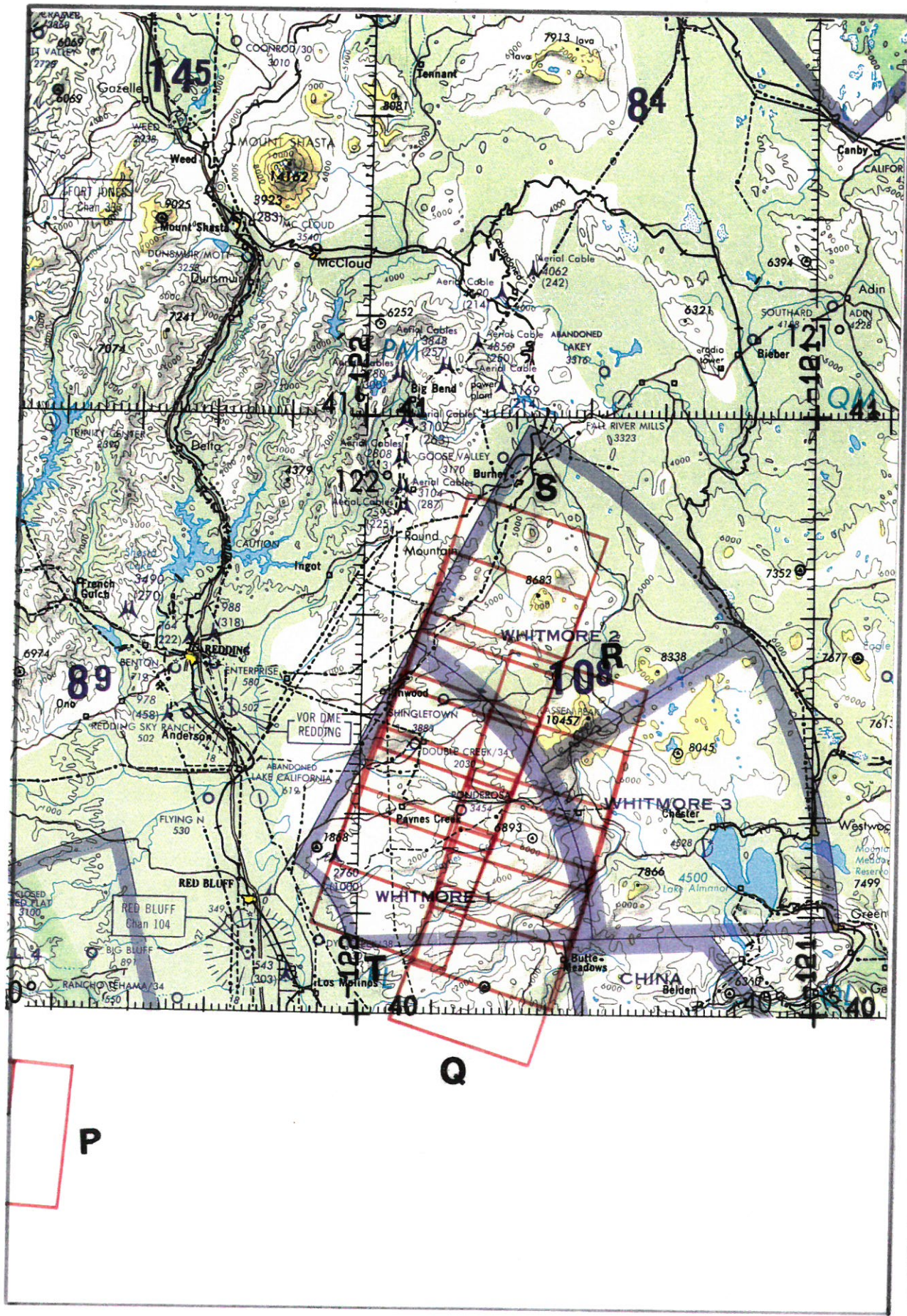
13 August 1990

RC-10 / AVIRIS / TMS

Accession # 04094

CNC 9-18





P

Q

FLIGHT 90-129  
13 August 1990  
RC-10 / AVIRIS / TMS  
Accession # 04094  
CNC 6-18