FLIGHT SUMMARY REPORT

Flight Number: 94-141

Calendar/Julian Date: 15 September 1994 • 258

Sensor Package: Wild-Heerbrug RC-10
Airborne Visible and Infrared Imaging Spectrometer (AVIRIS)
Thematic Mapper Simulator (TMS)

Area(s) Covered: Payette National Forest

Investigator(s): Weber, USDA Forest Service **Aircraft #:** 706

SENSOR DATA

Accession #:	04809	-----	-----
Sensor ID #:	034	099	074
Sensor Type:	RC-10	AVIRIS	TMS
Focal Length:	12" 304.66 mm	-----	-----
Film Type:	Aerochrome IR SO-060	-----	-----
Filtration:	Wratten 12	-----	-----
Spectral Band:	510-900 nm	-----	-----
f Stop:	11	-----	-----
Shutter Speed:	1/150	-----	-----
# of Frames:	255	-----	-----
% Overlap:	70	-----	-----
Quality:	Good	-----	Good
Remarks:	Camera clock offset 18.3 seconds from navigation data		

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(s) and camera(s) 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 μm).

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 μm
Pixels/Scan Line:	614
Number of Spectral Bands:	224
Digitization:	10-bits
Data Rate:	17 MBPS

Spectrometer	Wavelength Range	Number of Bands	Sampling Interval
1	0.41 - 0.70 μm	31	9.4 nm
2	0.68 - 1.27 μm	63	9.4 nm
3	1.25 - 1.86 μm	63	9.7 nm
4	1.84 - 2.45 μm	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:

Daedalus Channel	TM Band	Wavelength, μm
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)

Camera Systems

Various camera systems and films are used for photographic data collection. Film types include high definition color infrared, natural color, and black and white emulsions. Available photographic systems are as follows:

- Wild-Heerbrug RC-10 metric mapping camera
  - 9 x 9 inch film format
  - 6 inch focal length lens provides area coverage of 16 x 16 nautical miles from 65,000 feet
  - 12 inch focal length lens provides area coverage of 8 x 8 nautical miles from 65,000 feet

- Hycon HR-732 large scale mapping camera
  - 9 x 18 inch film format
  - 24 inch focal length lens provides area coverage of 4 x 8 nautical miles from 65,000 feet

- IRIS II Panoramic camera
  - 4.5 x 34.7 inch film format
  - 24 inch focal length lens
  - 90 degree field of view provides area coverage of 2 x 21.4 nautical miles from 65,000 feet

The U.S. Geological Survey's EROS Data Center at Sioux Falls, South Dakota serves as the archive and product distribution facility for NASA-Ames aircraft acquired photographic and digital imagery. For information regarding photography and digital data (including areas of coverage, products, and product costs) contact EROS Data Center, Customer Services, Sioux Falls, South Dakota 57198 (Telephone: 605-594-6151).

For specific information regarding flight documentation, sensor parameters, and areas of coverage contact the Aircraft Data Facility, NASA-Ames Research Center, Mail Stop 240-6, Moffett Field, California 94035-1000 (Telephone: 415-604-6252). Additional information regarding ER-2 acquired photographic and digital data is also available through the Aircraft Data Facility.

CAMERA FLIGHT LINE DATA
FLIGHT NO. 94-141

Accession # 04809

Sensor # 034

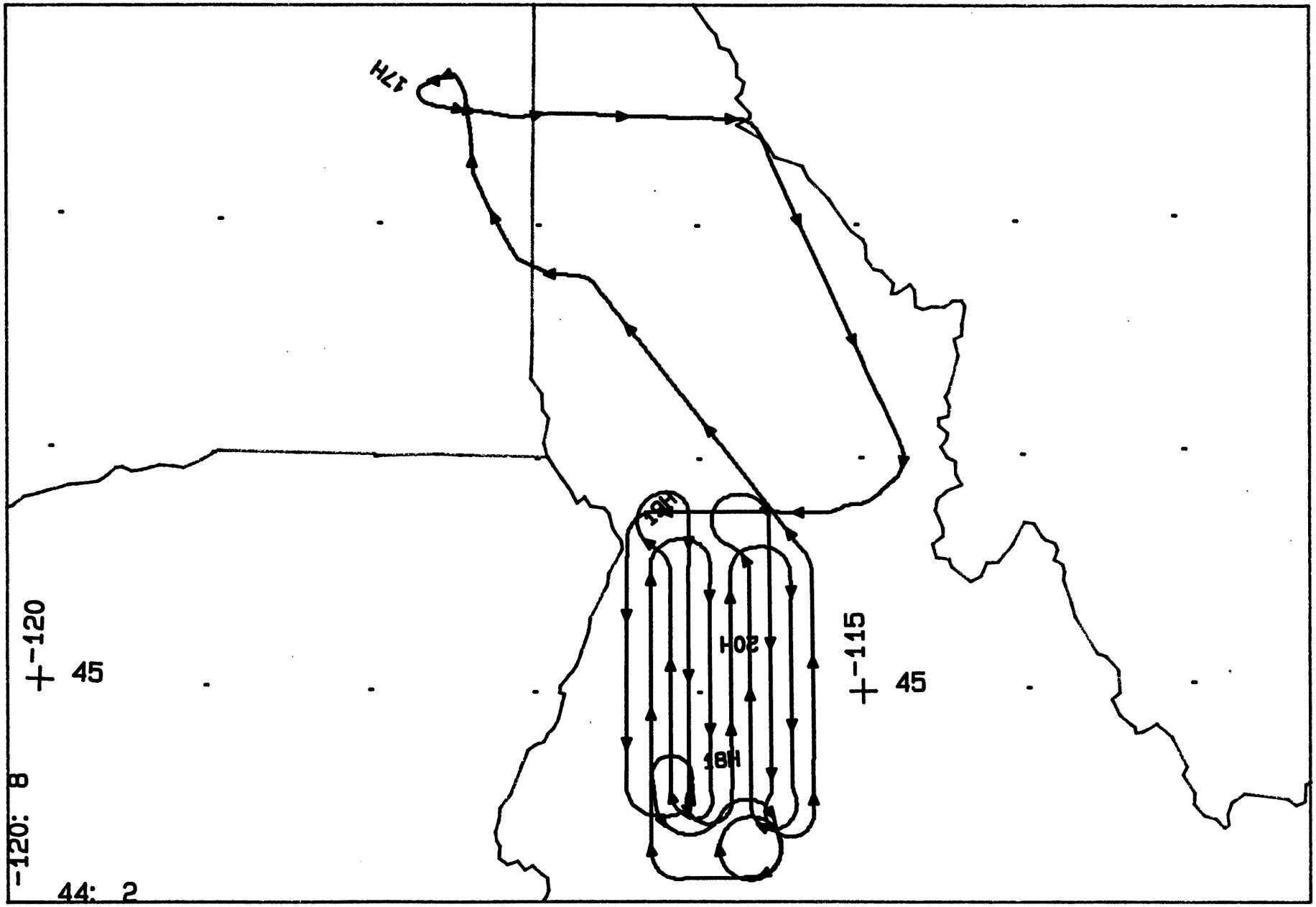
Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
A - B	6264-6290	17:46:48	17:55:20	65000/19800	10-20% cumulus (frames 6262-6280)
C - D	6291-6318	18:25:59	18:34:54	"	Minor-10% cumulus (frames 6293-6301); 10-20% cumulus (frames 6310-6318)
E - F	6319-6342	18:38:44	18:46:21	"	10-30% cumulus
G - H	6343-6366	18:50:31	18:58:09	"	10% cumulus (frames 6343-6345); minor-30% cumulus (frames 6350-6366)
I - J	6367-6392	19:05:45	19:14:03	"	10-40% cumulus (frames 6367-6371); minor-10% cumulus (frames 6372-6384)
K - L	6393-6417	19:18:01	19:26:00	"	10-20% cumulus (frames 6393-6403); 10-30% cumulus (frames 6405-6417)
M - N	6418-6441	19:29:50	19:37:29	"	10-30% cumulus
O - P	6442-6466	19:41:51	19:49:51	"	Minor cumulus (frames 6445-6447); 10-40% cumulus (frames 6455-6466)
Q - R	6467-6493	19:57:21	20:06:00	"	30-70% cumulus (frames (6467-6469); 10-20% cumulus (6470-6484); minor-10% cumulus (frames 6486-6493)
S - T	6494-6518	20:11:05	20:19:05	"	10-40% cumulus

TMS SCANNER FLIGHT LINE DATA

FLIGHT NO. 94-141

DAEDALUS FLIGHT DATA
FLIGHT NUMBER: 94-141

Check Points	Actual time (GMT) begin	end	Actual scanline begin	end	Altitude feet/meter	Scan Speed (rps)	total Good scanlines	total Interpolated scanlines	total Repeated scanlines
A-B	17:45:53.Ø	17:55:31.Ø	75387	82515	65ØØØ/19812	12.5Ø	7128	1	Ø
C-D	18:24:32.Ø	18:34:5Ø.Ø	1Ø3965	111588	65ØØØ/19812	12.5Ø	7623	1	Ø
E-F	18:38:19.Ø	18:46:28.Ø	114162	12Ø2Ø1	65ØØØ/19812	12.5Ø	6Ø4Ø	Ø	Ø
G-H	18:5Ø:13.Ø	18:57:58.Ø	122973	128715	65ØØØ/19812	12.5Ø	5743	Ø	Ø
I-J	19:Ø4: 7.Ø	19:13:45.Ø	133269	14Ø397	65ØØØ/19812	12.5Ø	7129	Ø	Ø
K-L	19:17:29.Ø	19:25:46.Ø	143169	1493Ø7	65ØØØ/19812	12.5Ø	6138	1	Ø
M-N	19:29:39.Ø	19:37:47.Ø	152178	158217	65ØØØ/19812	12.5Ø	6Ø4Ø	Ø	Ø
O-P	19:41: Ø.Ø	19:49:39.Ø	16Ø593	167ØØ4	65ØØØ/19812	12.5Ø	64Ø7	Ø	5
Q-R	19:55:39.Ø	2Ø:Ø5:4Ø.Ø	171459	178884	65ØØØ/19812	12.5Ø	7426	Ø	Ø
S-T	2Ø:Ø9:48.Ø	2Ø:18:45.Ø	181953	188586	65ØØØ/19812	12.5Ø	6634	Ø	Ø



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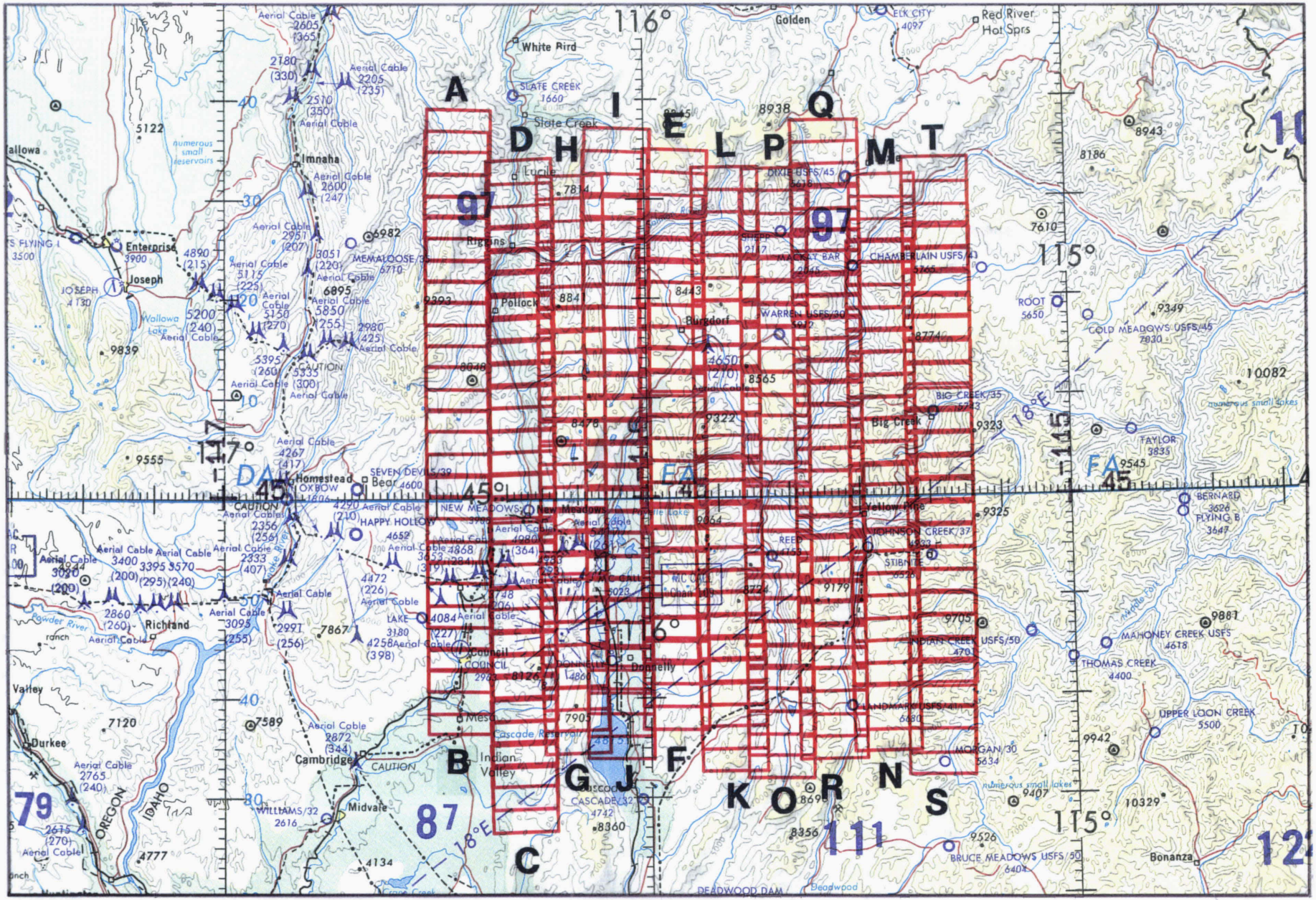
OVERLAY FOR %CNUSA LAMBERT CONFORMAL PROJECTION: SP1 = 43.6 SP2 = 47.1 CM = -116.2 ROTATED BY 0.0

16:58:10 TO 20:57:20 UT SCALE = 1:2.58E+06 TIME TICS EVERY 5.00 MINUTES



FLIGHT 94-141 15 SEPTEMBER 1994 A/C 706 RC-10 / TMS / AVIRIS ONC F-16