

# FLIGHT SUMMARY REPORT

**Flight Number:** 95-110  
**Calendar/Julian Date:** 13 July 1995 • 194  
**Sensor Package:** Wild-Heerbrugg RC-10  
Airborne Visible and Infrared Imaging  
Spectrometer (AVIRIS)  
Aerosol Particulate Sampler (APS)  
**Area(s) Covered:** Midwest (AVIRIS sites)

**Investigator(s):** Aber, U. of New Hampshire;  
Baumgardner, Purdue University

**Aircraft #:** 708

## SENSOR DATA

<b>Accession #:</b>	04949	-----	-----
<b>Sensor ID #:</b>	076	099	024
<b>Sensor Type:</b>	RC-10	AVIRIS	APS
<b>Focal Length:</b>	12" 304.89 mm	-----	-----
<b>Film Type:</b>	Aerochrome IR SO-060	-----	-----
<b>Filtration:</b>	Wratten 12	-----	-----
<b>Spectral Band:</b>	510-900 nm	-----	-----
<b>f Stop:</b>	11	-----	-----
<b>Shutter Speed:</b>	1/250	-----	-----
<b># of Frames:</b>	61	-----	-----
<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(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  $\mu\text{m}$ ).

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.

## **Aerosol Particulate Sampler**

The Aerosol Particulate Sampler (APS) has been developed and is operated by Dr. Guy Ferry of the NASA-Ames Research Experiments Branch. The sampler is a non-imaging sensor designed to gather high altitude dust particles for laboratory research.

## **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-Heerbrugg 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).

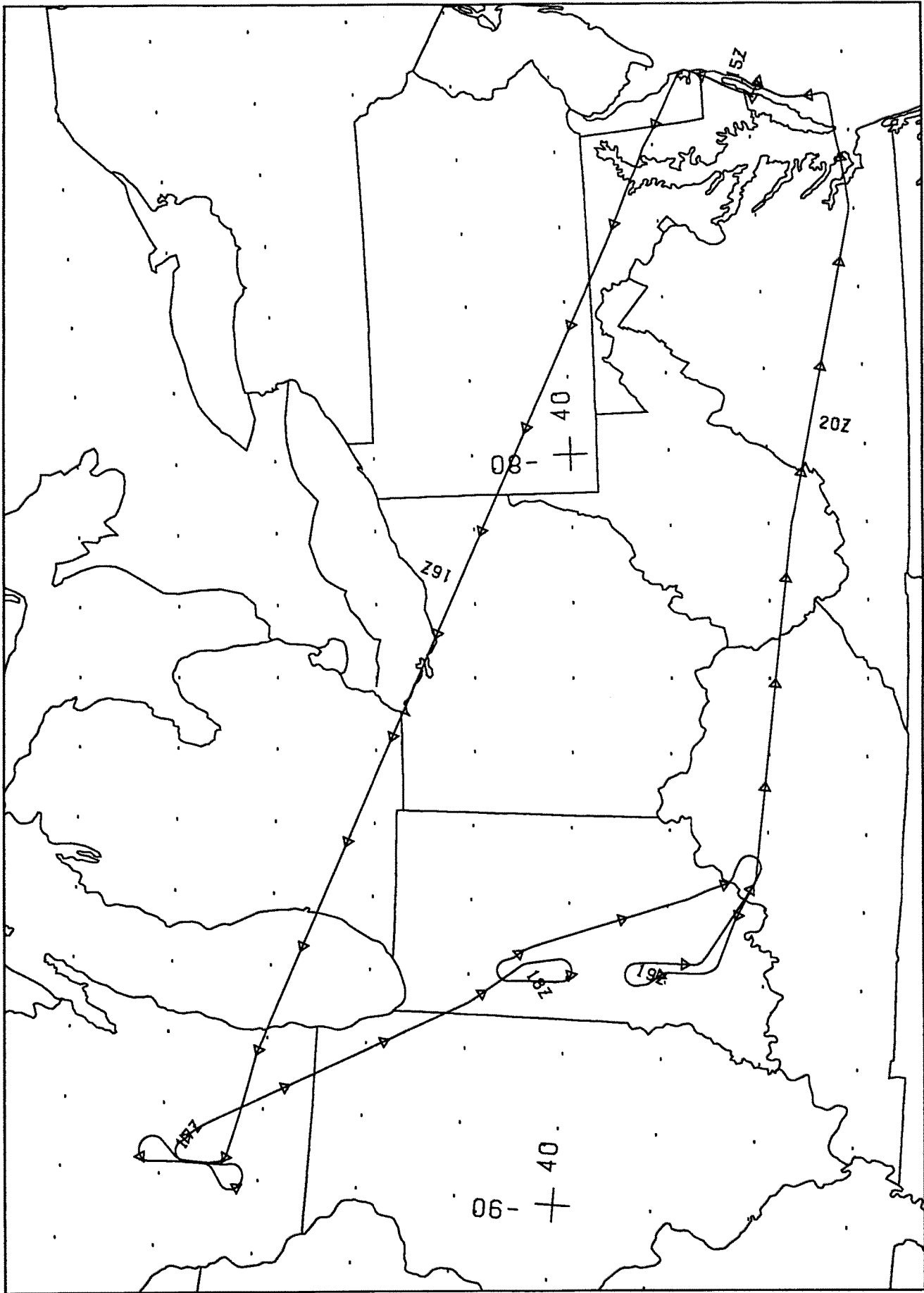
Additional information regarding ER-2 acquired photographic and digital data is available through the Aircraft Data Facility at Ames Research Center. For specific information regarding flight documentation, sensor parameters, and areas of coverage contact the Aircraft Data Facility, NASA-Ames Research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

**CAMERA FLIGHT LINE DATA  
FLIGHT NO. 95-110**

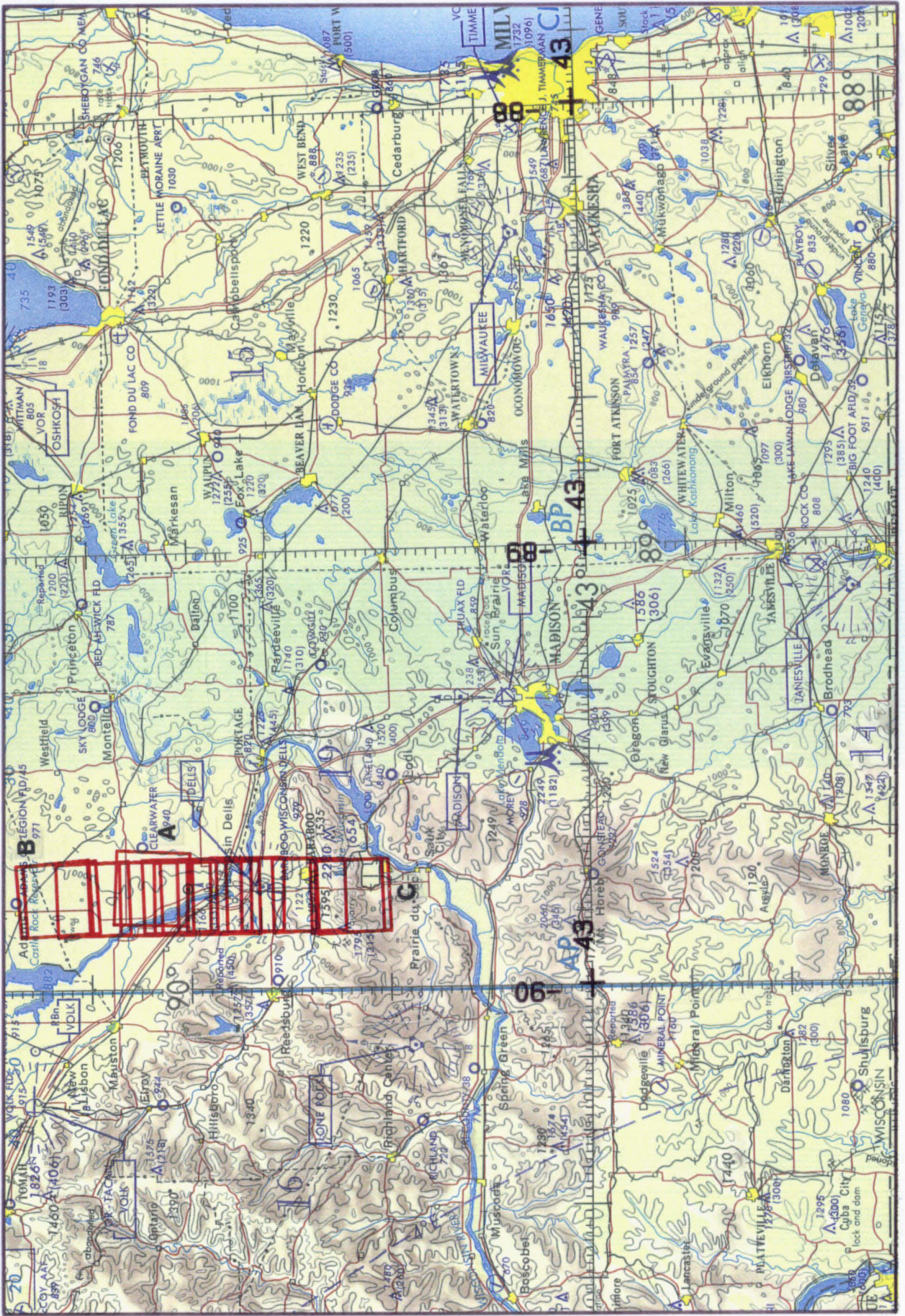
Accession # 04949

Sensor # 076

Check Points	Frame Numbers	Time (GMT-hr, min, sec)		Altitude, MSL feet/meters	Cloud Cover/Remarks
		START	END		
A	4239	17:01:58	17:01:58	63800/19446	Clear
B - C	4240-4246	17:11:09	17:13:41	63543/19368	10% cumulus (frames 4240-4241)
C - B	4247-4253	17:22:15	17:24:47	63871/19468	Clear
D - E	4254-4260	18:02:35	18:05:06	65086/19838	30-50% scattered cumulus
F - G	4261-4268	18:10:36	18:13:37	64888/19778	10-50% scattered cumulus
H - I	4269-4275	18:44:13	18:46:44	65429/19943	Minor-10% cumulus
J - K	4276-4283	18:54:08	18:57:09	66038/20128	Minor cumulus (frames 4276-4277 and 4280-4281); light haze throughout
L - M	4284-4292	19:05:17	19:08:47	66022/20124	Minor cirrus and cumulus (frames 4289-4291); light haze throughout
I - H	4293-4299	19:15:44	19:18:16	66457/20256	Minor-10% cumulus (frames 4297-4299)
<b>APS ON/OFF 15:47:00/20:17:00</b>					



FLIGHT 95-110      13 JULY 1995      A/C 708      RC-10 / AVIRIS





FLIGHT 95-110      13 JULY 1995      A/C 706      RC-10 / AVIRIS      JNC 45